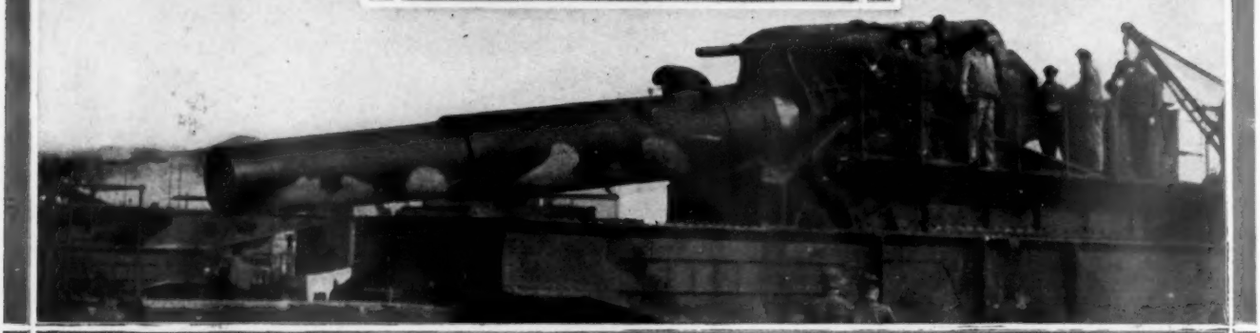
Railway Age

Vol. 64. June 28, 1918 No. 26



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EDWARD A. SIMMONS, *Pres.* L. B. SHERMAN, *Vice-Pres.* HENRY LEE, *Vice-Pres. & Treas.* M. H. WIUM, *Secretary.*

CHICAGO: Transportation Building. CLEVELAND: Citizens Building. WASHINGTON: Home Life Building.

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ROY V. WRIGHT, Managing Editor.

W. E. HOOPER, E. T. HOWSON, H. B. ADAMS, H. F. LANE, R. E. THAYER, C. B. PECK, W. S. LACHER, J. G. LITTLE, A. F. STUEBING, C. W. FOSS, K. E. KELLENBERGER, A. G. OEHLER, F. W. KRAEGER, G. L. LACHER, E. L. WOODWARD, B. W. MEISEL

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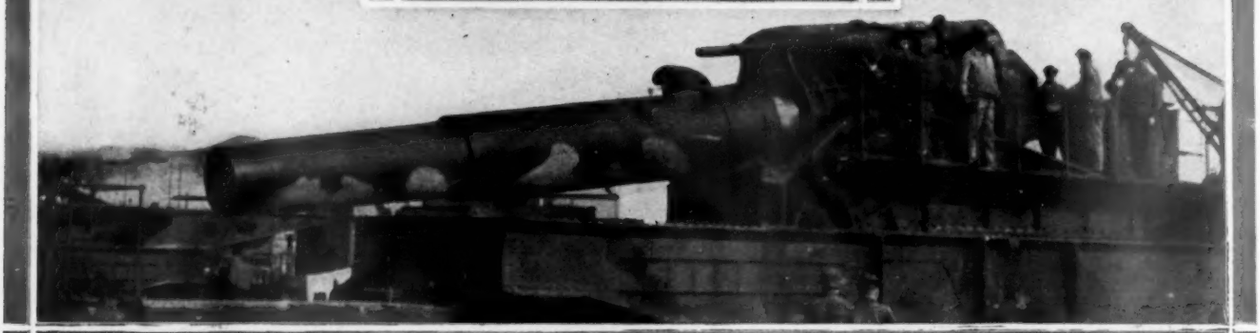

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EDITORIAL

Railway Age

"Safety-First" is now eight years old and is a somewhat hackneyed topic; but any one who reads the article on the subject which is printed on another page of this paper, giving an up-to-date picture of a large safety organization, will at once be reminded that there is nothing stale about it. Ambitious railroad officers have, today, as definite a field for activity in this direction as did those of eight years ago, for the constant accessions of new men in the service and the innate carelessness of all men (except as they cultivate alertness of mind) call for the constant repetition of old lessons. Men walk in front of moving cars, or neglect to report loose planks, or indulge their fondness for taking risks in various ways, just as they did in 1910. Men who seem otherwise to be level-headed will risk their lives to save one minute. Thousands of our railroad men have gone to France and are engaged in an enterprise where safety is rightly placed secondary; their first care is for the glory of the flag and the protection of helpless humanity, a duty which often must ignore safety. For us who are not soldiers, but who have a duty efficiently to feed, clothe and comfort the soldiers, the prime duty remains the same as before; to keep body and mind fit for the highest efficiency. Safety-first means safety all the time. One who, for a high cause, ignores personal safety is, indeed, a hero; but the every-day demand on the railroad man is for that patient continuance in well-doing which often proves more difficult than heroism.

National Campaign for Safety-First

The unsatisfactory condition which the country's transportation system is in at the present time is chiefly due to the malevolent and stupid policy of regulation of railways which prevailed for about ten years before we entered the great war. The railways were being operated, when government control was adopted, with the highest efficiency ever attained by any transportation system; and that they were unable to handle all the country's business was due to the arrest of the development of their facilities which had been caused by regulation. Two of the worst features of our system of regulation were the exercise of duplicated and often conflicting authority by the state and interstate commissions, and the prohibition of the Sherman law against every form of co-operation between parallel railways. It was hoped that, with the adoption of government control, the country would be freed from the effects of state regulation and the anti-trust law as applied to transportation, but this hope is being dissipated. The advance in freight rates, as originally planned, contemplated bringing the state rates up to the level of the interstate rates. The state commissions have made such a row about the matter, however, that they have frightened the Railroad Administration, and now it is announced that where state rates are lower than interstate they will be not brought to the same level. In other words, the unfair discriminations in rates resulting from both federal and state regulation are to be continued under government control. Again, the express companies have been merged, for both their good and that of the public, and the merger as originally planned was intended to be continued after the war. But the attorney-general of the United States has interposed, and a provision has been inserted in the contract under which the express companies must be unscrambled after the expiration of government control of railways. We think we detect a strong odor of politics about these matters. At any rate, they indicate that the Railroad Administration is capable of showing much more aggressiveness in dealing with railway presidents than in dealing with the politicians. It is a disgrace to the nation that the discriminations in rates growing out of state and federal regulation should thus be continued and that the asinine application of the Sherman law to the transportation business should be perpetuated.

Perpetuating Bone-Head Regulation

It is a universally acknowledged axiom that "experience is the great teacher." This statement is true only insofar as the lessons obtained from such experience are made applicable to similar conditions which may arise at some time in the future. Wrecks have occurred on American railroads in the past—and will continue to occur in the future. Lessons learned from such accidents in the past should be applied to eliminate as far as humanly possible such accidents occurring in the future. The collision which occurred on the Michigan Central at Ivanhoe, Ind., about half way between Gary and Hammond on the morning of June 22, appears to have been another case of plain man failure, the result being that a large toll of human life was taken.

What Lessons Do Collisions Teach?

The annual report for the year ending June 30, 1917, made by the Bureau of Safety to the Interstate Commerce Commission shows that of 11 collisions investigated which occurred in automatic block signal territory, 8 or 73 per cent, were caused by the failure of the engineman properly to obey signal indications.

The point at which this accident occurred is on double track territory equipped with modern automatic block signals, the roadbed and physical property being in excellent condition and the operation of trains being under the best modern American railway practice but still such catastrophes occur. What is the remedy?

Had this accident occurred with the railroads under private control certain papers would have immediately started a hue and cry over the *gross incompetency of the railroads under private management,* and would have come forward with a panacea to cure all ills of like nature, viz., the substitution of government operation.

Irrespective of the fact that this particular road is under government control, and that no deficiency in the physical property exists, the wreck occurred. The government has long recommended that certain steps be taken to lessen chances of such accidents, and it would appear that such recommendations should be put in force now that the roads are under government operation. It would appear advisable that some form of automatic stop should be employed in conjunction with the automatic signals to prevent just such accidents as that which occurred. The argument has been advanced that such an installation would tend to lessen the responsibility of the engineman and would put a premium on carelessness. This need not be the case. Such an automatic stop should be so devised as to register any disobedience of a signal indication on the part of the engineman in addition to applying the air and stopping the train. This

record could be used for the proper administration of discipline as warranted by facts.

The railroads have long been investigating the possibilities of automatic stops but development of such apparatus cannot be accomplished in a day. The development must be gradual and improvements made as found necessary, as was the case with automatic signals.

It appears the time is past when the roads should wait until the ideal stop can be developed before such an application is made and this is now a matter deserving the serious consideration of the Railroad Administration.

When it is shown that an employee is responsible for such an accident he should be prosecuted under the criminal laws of the state wherein the accident occurred and if found guilty the penalty for such offense should be imposed. If employees realized they were required to pay the penalty for acts of carelessness greater care would be exercised.

The Reorganization of the Railways

THE REORGANIZATION of the railroads under government operation is being made very complete. Organization is, first, a matter of personnel, and, second, of the offices which the officers hold and of the relations which the offices bear to each other.

The changes being made in personnel are greater in some sections and on some roads than in other sections and on other roads. A larger proportion of presidents are being appointed federal managers in the West than in the South, and a larger proportion of the presidents in the South are becoming federal managers than in the East. All over the country, however, the changes in personnel being caused by the appointment of general managers, federal managers, district managers and regional directors are very considerable. In many cases vice-presidents are being appointed federal managers, thus succeeding to many duties formerly performed by the presidents. In some cases general managers have been appointed federal managers. In other cases presidents of small roads have been appointed merely general managers. In two instances regional directors have been given charge of railways in territories in which they previously had had little or no experience.

It is a notable fact, however, that with few exceptions the executive and operating positions of importance have been given to railway men, and that those to whom they have been given have been men who already occupied high positions in the service or who had been put in line for promotion to high positions by the managements of the railway companies. While there may be ground for criticism in the fact that the government has adopted the policy which has caused many men of ability and experience to leave important executive positions, nobody who believes in the ability and fitness of the higher officers of the railways generally can offer any general criticism of the appointments thus far made to the positions of regional director, district manager, federal manager and general manager. Almost without exception men who are regarded in the railroad business as fitted by ability and experience for these places have been appointed.

The form of the new organization and the functions and relationships of the different offices in it present an interesting contrast to the organization which existed under private operation. Under the old organization many railway presidents were chief executives, reporting only to their boards of directors. In other cases there were chairmen who outranked the presidents. In most cases, however, the chairmen handled financial matters and large questions of railroad public policy, and the president was the real chief executive of the property. Under the new organization the federal manager of a railway has quite an imposing hierarchy over him. In some territories he reports to a district manager. Of higher rank than the federal or district manager is the regional director, of whom there are now seven. Ranking still above them are the heads of the divisions of the Railroad Administration in Washington, who report to the assistant director general and the director general. In other words, in all cases the federal manager has at least four officers of higher rank over him, and in some territories five. All of these officers of higher rank have assistants of their own.

Now, in order to bring about due co-ordination of the railways it may be necessary to superimpose upon the federal manager this hierarchy of officials, but it is evident that unless the new organization is operated with great skill the position of the federal manager, especially of a large road, is going to be made very difficult. He will receive suggestions and instructions from numerous officers of higher rank, and he will have a lot to do if he observes all these suggestions and instructions. He will also have to perform functions formerly performed by the vice-president in charge of operation, the vice-president in charge of traffic, and the president of the road. This will be especially true on a road on which the vice-president in charge of operation has been made federal manager and no officer occupying a position equivalent to that of vice-president in charge of operation has been appointed. If the federal manager devotes too much of his time and energy to carrying out the suggestions and instructions of his superiors he will neglect work which he ought to do in order properly to maintain the property and serve the public. If, on the other hand, he devotes himself intensively to operating and maintaining the property and trying to satisfy the public, he may find himself in hot water because of failure to carry out all the suggestions and instructions of superior officers.

It seems obvious that, as under the old organization of the railways the president was the man who chiefly determined whether the railway was managed efficiently or not, so under the present organization the federal manager will mainly determine whether the operation of the property will be efficient or not. The success of the federal managers in getting results and the comfort or discomfort of their positions will depend very largely upon the authority and freedom of action they are given by the Washington office and by the regional directors. It never was true that a railway could be successfully operated from Wall Street, and it never will be true that the various parts of the railway system of the United States can be successfully operated from Washington. The regions into which the railways are divided even under the new organization contain an average of almost 40,000 miles of line, and this much mileage of railway cannot be well operated from a single headquarters. Therefore, if good results are to be obtained the Washington office will have to delegate very large authority and give great freedom of action to the regional directors and they, in turn will have to delegate very large authority and give great freedom of action to the district and federal managers. The present organization has the form of a great bureaucracy. It easily could be allowed to develop the red tape and the practice of "passing the buck" which are characteristic of the typical bureaucracy. There is danger that it will develop these characteristics in any case, and it certainly will unless the federal managers are given large authority and opportunity, the Washington office and the regional directors devoting themselves chiefly, not to trying to direct in detail the operation of the properties, but to trying to co-ordinate their operation.

Before government control was adopted it was predicted that it would result in the development of a great "overhead" organization. This prediction is being rapidly verified. Probably without such an organization the object of securing the operation of the railways as a single consolidated system could not be fully attained. It would appear, however, that in the long run the cost of this overhead organization will approach and perhaps equal any savings which may be made

by changes or reductions in the staffs of the individual lines. Only subsequent developments will show what increases in the efficiency and the economy of operation will be secured.

Control of Export Traffic

THE ANNOUNCEMENT LAST WEEK by the Secretary of War, the Secretary of the Navy and Director General McAdoo of the creation of a joint exports control committee with complete power to control the movement of export freight, represents one of the most important steps toward co-ordinating war transportation that has yet been taken by the government. If such a committee is able to organize itself so as to function in accordance with its purpose and its authority, it is not difficult to believe that its formation a year or two ago might have prevented most of the difficulties, at least from an operating standpoint, that led to the government's commandeering of the railroads; but, like many other things that are now being done, its necessity was not sufficiently recognized until after bitter experience had taught the lesson.

It is not only the duty of the committee to inform itself as to the probable amount of freight which must be exported for the prosecution of the war, how this freight can best be routed through the various ports, how much other essential export traffic must be handled and the amount of local traffic necessary for each port, but the functions of the committee are far more than advisory. It is to have authority to select the port to which specific freight shall be transported for trans-shipment overseas for the use of the army and navy, the allied governments and others, and it is given the responsibility of deciding the distribution of the combined amount of all exports as between the various ports so as to facilitate its handling at any one port and to avoid congestion at any one port. In order to carry out its important task with full knowledge of the various requirements, the committee consists of authoritative representatives of the War and Navy Departments, the Railroad Administration and the shipping interests and the Traffic Executive controlling the allied traffic. Its organization is the result not only of numerous conferences between all interests involved, but of numerous special studies that have been made by experts representing the Railroad Administration and the Shipping Board into the conditions surrounding export traffic.

Long before the United States entered the war, the results of a lack of co-ordination and control of export traffic were made evident in serious congestion throughout the eastern industrial section and particularly at the North Atlantic port terminals. Shippers who received their money for goods consigned to the allied governments as soon as the freight was loaded on cars were naturally over-zealous in starting freight toward the ports regardless of the possibilities of handling it at destination or of the capacity of boats to carry it across the ocean. At a time when the country had not yet awakened to the seriousness of the situation railroads were too reluctant to place drastic embargoes and rather than risk the unpopularity of doing so, tried to crowd more freight through the neck of the bottle than could be accommodated. When the embargoes finally were placed it was too late. More freight than could be transshipped had been carried to the eastern terminals, choking the main lines as well as yard and terminal tracks, and when this situation developed to such an extent that it was necessary to unload freight on the ground, the congested condition extended so far back toward the west that it was difficult to return empty cars. The unpopularity of the embargo was so great that freight would often be embargoed half way towards its destination and intermediate lines were blocked in both directions.

This condition became steadily more acute and, while many people blamed the railroads, the railroads retorted by saying that the difficulty was with the shipping situation. They were carrying freight to destinations as billed, but ships were not available to take away the freight they had delivered. While certain ports were overcrowded others were not being utilized to capacity, but the railroads had no control over the routing of freight, and goods were sent to the ports where the boats were most numerous. When efforts were made to secure a larger number of sailings to the ports which were not being utilized to capacity the shipping interests said that the freight offered at those ports was not sufficient to justify them in sending vessels there.

Now the routing of freight has been taken out of the hands of the shipper and placed in the hands of the railroads, and with the creation of the exports control committee there is sufficient authority to direct the railroads where to put the freight and simultaneously to direct the boats to go there and get it. Moreover, the committee will be able to develop a policy which has already been under way for some time, of using the embargo for regulative purposes. The congested condition has improved to such an extent that it is not necessary to use embargoes to prevent the movement of freight, but they may be used to prevent it from going in the wrong direction. When embargoes were formerly treated as an emergency measure to be applied whenever and wherever the necessity became evident or, as too frequently happened, a little bit after that time, they frequently caught the freight part way to its destination in such a way that it could move neither backward nor forward, but only added to the congestion. Now it is possible to apply the embargo at the point of origin so that consignments will not be sent to ports where they cannot be handled, but may be diverted to places where they are needed and can be accommodated. This is expected to develop a much more intensive use of the South Atlantic and Gulf ports, which still have much unutilized capacity and still greater potential capacity.

Changing Wheels on Freight Cars

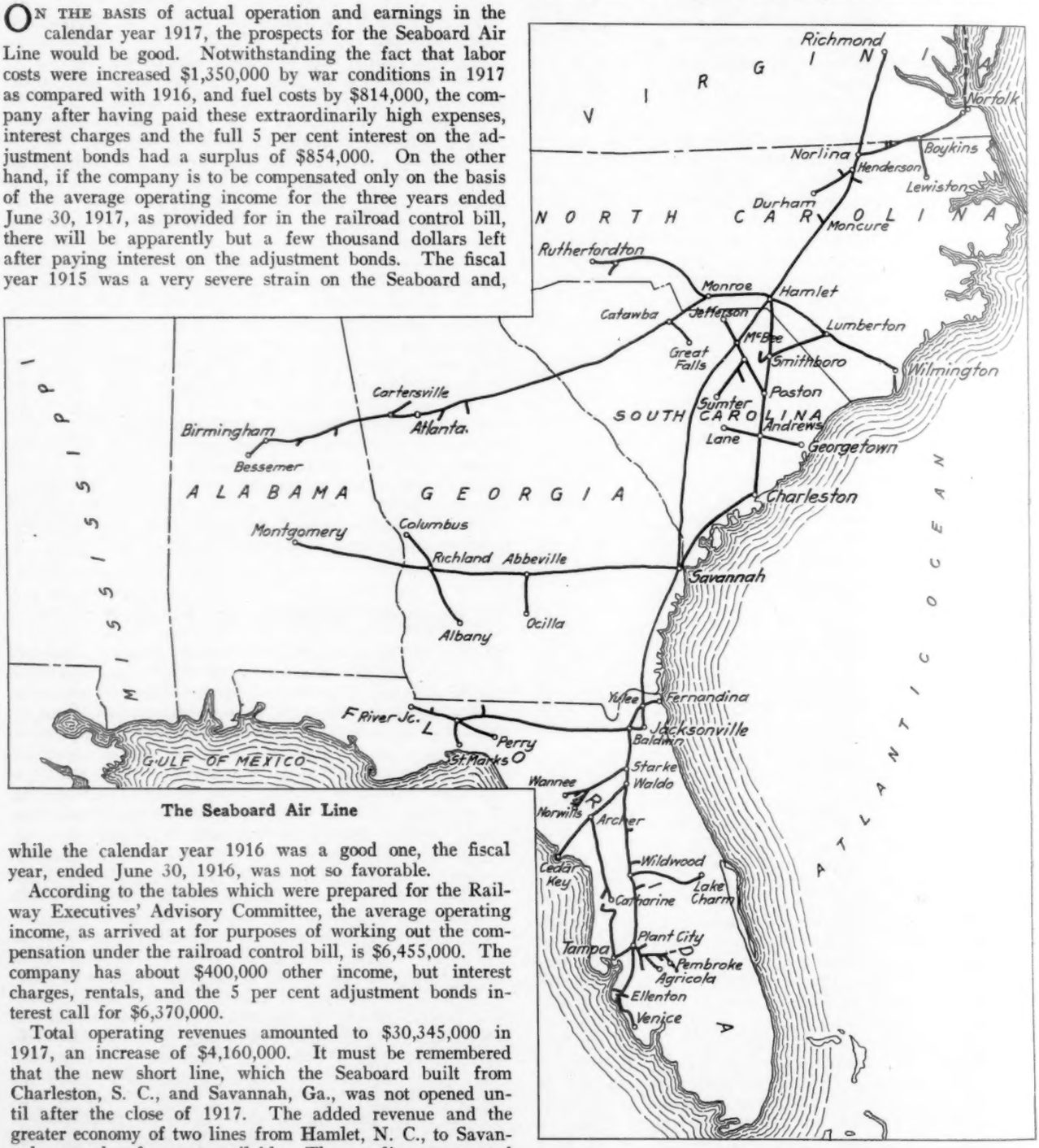
THERE ARE ALMOST none of the repairs ordinarily included in the everyday maintenance of freight cars which can long be overlooked for the sake of the immediate advantage without seriously impairing future transportation capacity. There are some repairs, however, which, for the sake of safety, must not be neglected even for temporary advantage. Truck repairs belong to this class. That there has been some neglect of this important matter is indicated by the epidemic of truck failures generally experienced last winter. These failures may in part be attributed to the extraordinary weather conditions prevailing, but the one great underlying cause was probably the letting down of the standard of wheel maintenance, permitting defective wheels to remain too long in service before removing them.

Defective wheels are not only unsafe in themselves, but may result in more deterioration of the whole structure of the car, especially the truck, in one mile than would ordinarily occur in hundreds of miles of service. There should be a general raising of the standard of wheel conditions. Wheels should be changed before they reach the M. C. B. limits rather than a little after these limits are reached. The average car load has materially increased during the past year, owing to heavier loading of all classes of cars, and, on many lines, to an increase in the proportion of commodity freight moved in maximum capacity loads. Furthermore, war conditions have forced a lowering of former standards of track maintenance. Truck failures mean wrecks and consequent loss of equipment and lading, and temporary suspension of traffic movement. At present we can ill afford to stand any of these losses. Safety, therefore, demands that the condition of wheels be improved by a

more rigid inspection and changing of the wheels of all cars passing over the repair track, before the M. C. B. limits have been exceeded.

Seaboard Air Line

ON THE BASIS of actual operation and earnings in the calendar year 1917, the prospects for the Seaboard Air Line would be good. Notwithstanding the fact that labor costs were increased $1,350,000 by war conditions in 1917 as compared with 1916, and fuel costs by $814,000, the company after having paid these extraordinarily high expenses, interest charges and the full 5 per cent interest on the adjustment bonds had a surplus of $854,000. On the other hand, if the company is to be compensated only on the basis of the average operating income for the three years ended June 30, 1917, as provided for in the railroad control bill, there will be apparently but a few thousand dollars left after paying interest on the adjustment bonds. The fiscal year 1915 was a very severe strain on the Seaboard and, while the calendar year 1916 was a good one, the fiscal year, ended June 30, 1916, was not so favorable.



The Seaboard Air Line

According to the tables which were prepared for the Railway Executives' Advisory Committee, the average operating income, as arrived at for purposes of working out the compensation under the railroad control bill, is $6,455,000. The company has about $400,000 other income, but interest charges, rentals, and the 5 per cent adjustment bonds interest call for $6,370,000.

Total operating revenues amounted to $30,345,000 in 1917, an increase of $4,160,000. It must be remembered that the new short line, which the Seaboard built from Charleston, S. C., and Savannah, Ga., was not opened until after the close of 1917. The added revenue and the greater economy of two lines from Hamlet, N. C., to Savannah were, therefore, not available. The new line was opened January 1, 1918, and should add to revenues as well as decrease the cost of handling through business from Florida to Richmond and Norfolk. The facts, therefore, that the 1917 gross revenues increased by 15.89 per cent and operating expenses by 23.87 per cent, and in 1918 the Seaboard will have the further increased revenues from the new line and a larger proportionate operating income, justify the belief that so far as actual showing is concerned, the road will do well in 1918.

It would appear that the Seaboard is one of the companies which will suffer a real injustice if an adjustment is not made in working out the compensation to provide for special cases. In view of this situation, it is understood that the Seaboard will make application for an increase in its compensation to cover at least the interest on the investment occasioned by the cost of these lines, which will amount to at least $850,000. It is also understood that it has in

contemplation the making of other just claims which will add to this amount.

The operation of the road was seriously hampered by the shortage of labor in 1917. Common labor, especially, was almost impossible to procure in the quantities needful; thus, in addition to the increased price of coal, a much heavier labor charge had to be paid to get this coal placed on tenders. Track labor was particularly scarce and poor. There was $3,216,000 spent for maintenance of way in 1917, an increase of only a few thousand dollars over 1916; but the 1917 expenditure represented less work done than was done in 1916 and is not an accurate measure of the amount that would have been spent had track labor been available.

Maintenance of equipment cost $5,105,000, an increase over 1916 of $1,195,000. Both increased cost of labor and increased costs of materials figured in this maintenance of equipment expenditure.

Transportation expenses amounted to $10,252,000, an increase of $2,560,000 over 1916. The increase in fuel cost has already been mentioned. Higher wages paid to enginemen and trainmen affected the Seaboard as it did all other roads that were forced to grant higher wages to the brotherhoods under the guise of an eight-hour day law. There were other costs, however, which bore particularly heavy on the Seaboard as, for instance, labor at stations which, in 1917, cost $567,000, an increase of $108,000 over 1916. Yard conductors' and yard foremen's wages amounted to $159,000 in 1917, an increase of over $50,000, or nearly 50 per cent.

The following table shows the percentage of each class of operating expenses to total operating revenues:

	1917	1916
Maintenance of way	10.60	12.17
Maintenance of equipment	16.82	14.93
Traffic expenses	3.07	4.47
Transportation expenses	37.40	33.07
Miscellaneous expenses	0.67	0.58
General expenses	3.11	2.90
Total	71.57	66.96

Passenger revenues amounted to $7,777,000, an increase of $2,428,000. Freight revenues amounted to $19,674,000, an increase of $1,462,000. The tonnage of freight carried totalled 10,729,000, an increase over the previous year of only 2.22 per cent; but the average length of haul was 192 miles, an increase of over 13 per cent. The average rate per ton per mile was 9.56 mills, or 1.75 per cent lower than in 1916. The average trainload was 359 tons in 1917 as against 355 tons in 1916. The carloading was considerably better in 1917; the average being 17.68 tons as against 16.18 tons in 1916; and on all freight, including company freight, the average carload was 20.31 as against 18.23, an increase of more than 10 per cent.

The following table shows the principal figures for operation in 1917 as compared with 1916:

	1917	1916
Average mileage operated	3,461	3,452
Freight revenue	$19,674,328	$18,211,895
Passenger revenue	7,777,069	5,348,979
Total operating revenue	30,345,146	26,184,487
Maintenance of way and structures	3,215,505	3,187,544
Maintenance of equipment	5,105,472	3,909,974
Traffic expenses	931,259	907,086
Transportation expenses	11,347,770	8,660,088
General expenses	944,919	758,373
Total operating expenses	21,717,178	17,531,907
Taxes	1,380,253	1,210,691
Operating income	7,237,881	7,428,999
Gross income	7,629,257	7,889,431
Net income	2,104,067	2,862,011
Interest on 5 per cent income bonds	1,250,000	1,250,000
Surplus	854,067	1,612,011

Letters to the Editor

A Report "Greatly Exaggerated"

LOUISVILLE, KY.

TO THE EDITOR:

In your issue of May 3, page 1152, you say that Patrick Ryan, locomotive engineman of the Illinois Central, member of the American Railway Engineers' Regiment in France, was killed in action on April 18. This is not correct.

Pat Ryan was traveling engineer on Kentucky division of the Illinois Central when he enlisted in the Engineers' Regiment, and I am today in receipt of a letter from Pat in which he states that he is not dead but that they are using him for a traveling crane in the back shop of a French locomotive works. He stands 6 ft. 4 in. in his stocking feet and says he is able to pick up a French locomotive under each arm and place it where it is desired! T. E. HILL,

Superintendent Kentucky Division, Illinois Central.

General Order No. 20

ST. MARY'S, PA.

TO THE EDITOR:

In the writer's opinion General Order No. 20 is based on the idea that every person who has anything to do with statements, bills, etc., will consider it his patriotic duty to live up to the intent of the order to the best of his ability, without taking advantage of the injunction which the order places on the road against which the billing is rendered. That all of us are not playing the game fairly is illustrated by the following actual case where the billing road takes advantage of the protection against checking and absolutely disregards the last sentence of the order, which reads:

"The carrier rendering such statements, bills, etc., shall take the necessary measures to insure the correctness thereof."

A car repair bill was recently rendered which contained charges made against nearly 100 cars; 46 per cent of the cars and 39 per cent of the amount of the charges did not belong to the road billed. These errors were so apparent that a glance detected them and checking was not necessary. Request was made for correction and the only reply made by the billing road was the following notation made on the original request for correction: "See Order No. 20 of April 22, 1918; withdraw exception."

While no road should pick up errors in violation to Order No. 20 it is absolutely necessary to take some step to prevent deliberate attempts to bluff such glaring errors to a conclusion.

It is evident either that the person making the bill did not fully digest General Order No. 20, which was mentioned as backing for the billing road's position, or it was a deliberate attempt to "put one over." Ordinary precaution was not exercised to get the correct initials of the cars repaired when the repair cards were made out because it would be very unusual to get 46 per cent of the car initials wrong, especially when the repairs were supposed to be made at twelve different places on the billing road. Again, the person who made the bill did not use the Equipment Register to ascertain whether the cars belonged to the road billed. If railroads are going to live up to General Order No. 20 in not checking car repair bills and bills can be rendered for cars that do not belong to the roads billed against, what is to prevent the billing of half a dozen roads for the same repairs? What such proceedings will lead to is very apparent and they should be nipped in the bud. E. F. GIVIN,

Mechanical Engineer, Pittsburgh, Shawmut & Northern.

Temporary End of Double Track in the East Approach Cut of the Sherman Hill Tunnels

Completing the Double Track on the Union Pacific

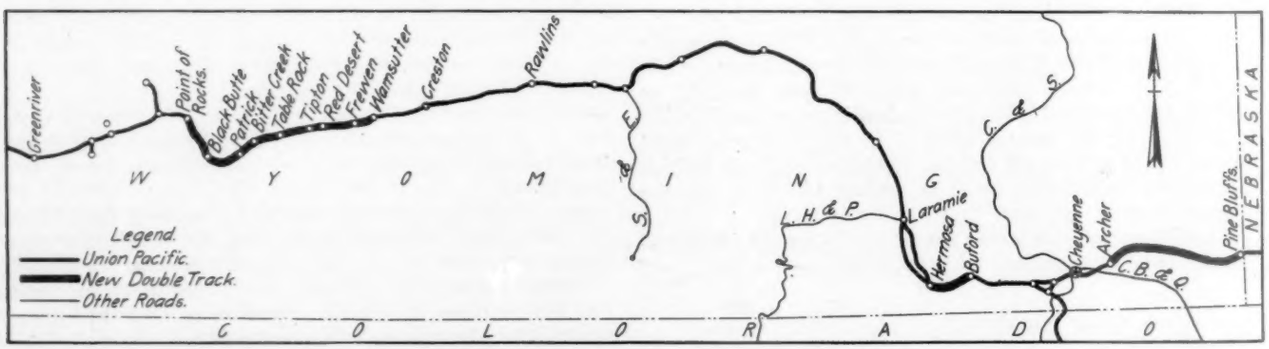
Heavy Traffic Necessitated the Construction of 96 Miles of Second Main Line During 1917

NEW IMPROVEMENTS carried on by the railroads during the past year are of greater importance as a war necessity than the closing of the last gaps in the double track line of the Union Pacific between Omaha, Neb., and Granger, Wyo. The traffic over this important artery of the country's commerce has increased greatly during the last 15 years, but the enormous impetus which war activities have given to the transportation of various commodities from the Pacific coast, combined with the almost total absence of shipping via the Panama Canal has imposed an unusually heavy burden on the Union Pacific, and in consequence the 96 miles of single track still remaining at the beginning of 1917 constituted a most serious obstacle to the free movement of the traffic.

This single track was in three sections: from Pine Bluffs, Wyo., to Archer, a distance of 33.35 miles in the engine district between Sidney, Neb., and Cheyenne, Wyo.; from Buford, Wyo., to Hermosa, a distance of 11.11 miles in the engine district between Cheyenne and Laramie; and from Wamsutter, Wyo., to Point of Rocks, 51.9 miles in the engine district between Rawlins, Wyo., and Green river. The first of these sections is located within the limits of the Union Pacific's water grade line from Archer, Wyo., to Omaha and involved no grade or line changes. The other two sections are within the limits of the extensive reconstruction carried out between 1898 and 1902 and in consequence such grade revisions as were made in this recent work do not radically affect the existing operating arrangements. In general the prosecution of this work was characterized by an effort to complete short sections of the second track as quickly as possible in order that they could be turned over to the operating department immediately, and these additions to the existing double track, made from time to time during the course of the work, did much to relieve the congestion of traffic under which the operating department was laboring.

A Comparison of Traffic Densities

Some idea of the growth of the traffic on the Union Pacific may be gained from a comparison of the train movements at the present time with those at the completion of the grade revision work in 1902. At that time the average movement daily in each direction, on the engine district between Rawlins and Green river was four passenger and 7.5 freight trains. In comparison with this, in August, 1917, there were 9 to 10 passenger trains and an average of 16.5 freight trains each way, taking no account of the great increase in train load resulting from the use of heavier power. There have been days in the last year when as many as 90 trains were handled through the sections of single track.



Map of Union Pacific Lines in Wyoming, Showing Sections of New Double Track

The characteristics of the freight train movement in this same engine district for one month in 1917 is indicated by the following statement:

RAWLINS TO GREEN RIVER—134.2 MILES

	August, 1917	
	Net tons one mile	Net ton miles per mile of line
Westbound	30,057,000	224,000
Eastbound	59,170,000	440,900
Total	89,227,000	664,900
Average total number of freight trains daily		33
Average net tons per train		655

Between Cheyenne and Laramie the train movement was even heavier because practically the same traffic is handled in trains that averaged lighter.

CHEYENNE TO LARAMIE—56.7 MILES

	August, 1917	
	Net tons one mile	Net ton miles per mile of line
Westbound	11,800,000	208,100
Eastbound	24,627,000	434,300
Total	36,427,000	642,400
Average total number of freight trains daily		37
Average net tons per train		556

The figures for the average trainload in 1917 are not as larg as those in 1916, as shown by the following table:

AVERAGE NET TONS PER TRAIN AUGUST, 1916, AND AUGUST, 1917

Nebraska division	600 tons	1917
Nebraska division	763 tons	1916
Wyoming division	606 tons	1917
Wyoming division	707 tons	1916
Western division	652 tons	1917
Western division	656 tons	1916

There are two reasons for this: a greater proportion of unbalanced eastbound traffic in 1917 than in 1916 and the necessity for loading engines lighter in consequence of the congestion of traffic in order to expedite movement. There is, however, one exception to the conditions indicated in the above table and this is on the ninth engine district, between Evanston, Wyo., and Ogden, Utah, where the trainload was increased from 608 net tons in 1916, to 645 net tons in 1917, as a result of the completion of the grade reduction and second track between Wahsatch and Emory, described in the *Railway Age Gazette* of August 24, 1917, page 329.

West Portal of the Twin Tunnels

The Work Between Wamsutter and Point of Rocks

The longest single piece of double track work in the Union Pacific project was between Wamsutter and Point of Rocks, 51.9 miles, which comprises over one third of the engine district between Rawlins and Green river. Wamsutter is only 12 miles west of Creston, the Union Pacific crossing of the Continental divide. Nevertheless the country traversed between Wamsutter and Point of Rocks bears more of the characteristics of a heavy rolling country than a mountainous region. Because of this fact, it was possible to locate the original line with westbound grade not exceeding 1.33 per cent and an eastbound grade not over 1.28 per cent. In the revision work started in 1898 these grades were reduced to a maximum of 0.82 per cent in each direction. The double track work recently completed was the occasion of a further grade improvement, in that an eastbound line is provided with the maximum grade of 0.5 per cent and since this grade is not exceeded between Point of Rocks and Green river, the eastbound track has a ruling grade of 0.5 per cent for the 93 miles from Green river to Wamsutter. Advantage will be taken of this condition by loading eastbound tonnage trains for the 0.5 line and then reducing tonnage at Wamsutter to run the remaining distance to Rawlins. The improvement in grade was accomplished with a departure from the existing alinement only in the 15.36 miles between Tipton and Bitter creek. The second track follows the existing alinement for the entire distance from Wamsutter to Tipton and from Bitter Creek to Point of Rocks, although a slight change of alinement was made near the latter place to reduce curvature. Aside from the improvement in grade, the relocation between Tipton and Bitter creek accomplished a saving of 0.226 miles of distance and the new line has only four curves with a total angle of 105 deg. 37 min. as compared with 15 curves with a total angle of 193 deg. 37 min. on the old line. The maximum degree of curve is 2 deg. on both lines.

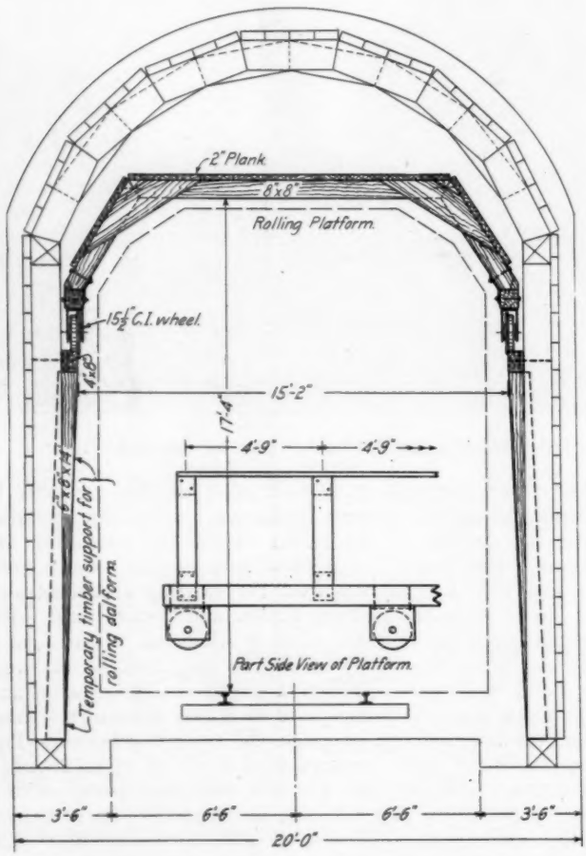
Widening Solid Granite Cut for Second Track

On the east end of the section, the work in the vicinity of Wamsutter and Frewen was relatively light, consisting for the most part of filling from borrow pits alongside with some large pits in the hillside. Near Red Desert there is an embankment ¾ mile long which was widened for second track from a large steamshovel pit. There was also some side hill work in this same vicinity with the second track alternately on the inside and outside of the old line.

Under normal conditions the grading on the change of line west of Tipton would be classed principally as team work, but owing to the shortage of men and teams it was handled largely as a steamshovel job, since shovels were used in cuts much smaller than are usually considered profitable

work for them. The largest work included two cuts 25 ft. deep and a fill 25 ft. high near Tipton. Between Point of Rocks and Tipton the total excavation was 450,000 cu. yd. of which 275,000 cu. yd. was from borrow. Near Monel a fill of 46,000 cu. yd. having a maximum height of 10 ft. was made with a steamshovel converted into a drag-line excavator. It was equipped with a 55-ft. boom and a 2-cu. yd. drag line bucket. This machine worked down one side of the fill and up the other, borrowing from pits on either side that were separated from the toe of the embankment by bermes 40 to 50 ft. wide. Two drag scrapers were employed to dress up the fill as the work progressed..

The bridge work consists in converting single-track, through-girder spans into double-track structures. At the crossing of Bitter creek where there are now three tracks, the 50-ft. single-track girder span is being replaced by three I-beam deck spans with open decks. There are also several arch culverts. The country traversed by this work is dry, there being no usable water supply in the entire distance between Point of Rocks and Wamsutter, so that the facilities for supplying the operating department with water in



Section Through the Old Tunnel Showing Platform Built for Repairing the Lining

this district had to be extended to furnish water also to the construction forces.

The new passing tracks are 4,000 ft. long. These include center passing tracks at Red Desert and Black Buttes, a new westbound passing track at Bitter creek and eastbound passing tracks on the new line opposite Monel and Table Rock. The work on this section was started in May, 1917, and finished in November, but large sections of the second track had been placed in service for a considerable time before the last work was completed.

The Sherman Hill Work

The work on Sherman hill, the highest point on the Union Pacific, involved the construction of 11.11 miles of second track between Cheyenne and Laramie. The crossing of the Laramie mountains constituted one of the most formidable obstacles in the original construction of the Union Pacific and was accomplished with adverse grades of 1.85 per cent and 1.66 per cent against eastbound and westbound traffic respectively, and with a maximum elevation of 8,247 ft. above sea level. Between 1900 and 1902 this part of the line was largely reconstructed. A new eastbound line on an independent location was built from Laramie to Hermosa, 15

Laying Track on the New Line Near Table Rock

miles, and a new single track line for traffic in both directions was built from Hermosa to Buford, 11 miles, so that the grades opposing the eastbound traffic were reduced to 0.82 per cent. Between Cheyenne and Buford, 26 miles, improvements were made, but it was found impracticable to provide a better grade than 1.65 per cent against westbound traffic, this being one of only two places on the Union Pacific between Omaha and Ogden where the 0.82 per cent ruling grade determined upon in 1898 proved impractical. The other point is between Emory, Utah, and Wahsatch where a new 1.14 per cent eastbound line was built in 1916.

The relocated line from Hermosa to Buford involved heavy work, including a tunnel 1,800 ft. long and several high fills and reduced the summit of the elevation to 8,010 ft. With the completion of double track up Buford hill, this section remains the one gap in the double track until the completion of the work undertaken last year. The character of this line is shown on the profile. A number of large gulches were encountered, some of which required embankments 120 to 130 ft. in height, and in the construction of the first track involved yardages of 500,000 to 760,000 cu. yd. of earth, while the entire 11 miles required a total of about 5,000,000 cu. yd. of material.

On the other hand the construction of the second track alongside the existing line involved the handling of only about 300,000 cu. yd. of material for the entire distance, so that it was the construction of the second track tunnel, rather than the embankments which constituted the most formidable feature in the work recently completed.

Excavation on the new work exclusive of the tunnel was classified as 125,000 cu. yd. rock and 25,000 cu. yd. earth in the cuts, with 150,000 cu. yd. of borrow. The most important question involved in this work was the stability of

the thin slabs of material placed on the sides of the high embankments to widen them the required amount, but owing to the absence of moisture and the preponderance of rock in both the old and new embankments, no trouble was encountered. The rough faces of the slopes afforded an adequate bond in most cases but as a special precaution the fills were benched, even resorting to the use of explosives in some cases before the new filling was placed. Excavation in the rock cuts was conducted with extreme care to avoid blocking the line and as shown in one of the photographs it was carried on with the use of narrow gage material tracks to avoid any use of the main track. No bridge work was involved in this

Dumping Muck from the East Heading Off a Trestle

project; drainage through the embankment was provided for by the extension of culverts.

The Tunnel

The twin tunnels on the Sherman hill pass through a ridge of granite having a crest 85 ft. above the top of rail, which reaches an elevation of 7,930 ft. on a vertical curve in the tunnel, the crest of a second summit that is separated from the main summit at Sherman station by a sag, having a minimum elevation at Dale creek of 7,860. The new tunnel is the same length as the old one and is located on a center line 32 ft. to the north of the old center line. This involved a base width of the approach cuts of over 50 ft. which, considering that each cut had a maximum depth of over 50 ft. involved a large increase in the cut excavation. The decision as to this feature, as with all matters having to do with the construction of the new tunnel, was determined by one consideration—the safety of the existing tunnel, for any accidents interfering with the movement of trains through the latter would have involved the interruption of the transcontinental traffic of the Union Pacific without chance of any detour east of Ogden.

Accordingly one of the first precautions taken was to repair the timber lining of the old tunnel to guard against rock falls resulting from vibrations incident to blasting on the new work. The manner in which this was done without interference with traffic is shown in the cross sectional drawing of the tunnel where a rolling platform is indicated on which men were supported while at work patching the timber work and filling voids in the packing. Owing to rush work in the completion of the original tunnel, the overbreaks in the arch and sides were larger than usual and a large amount of packing was necessary.

The new tunnel was driven by the top heading and bench method from four faces, one from each portal and two from a shaft driven down from the surface at mid-length and which was also connected with the old tunnel by an adit. The work on the heading was first carried out to the full width of the section down to the level of the wall plates of the arch timbering, but after noting some indications of distress in the walls of the old tunnel following blasts, the work on the headings was restricted to a 12-ft. drift along the north side. The remaining portion of the arch was later removed by shooting holes drilled parallel to the axis of the tunnel, taking special care not to disturb the wall between the two bores. The bench was taken down in two lifts of eight feet each, the muck being removed by air-operated steamshovels.

In the headings two Ingersoll-Leyner water drills were used mounted on columns and drilling 14 to 15 holes, 6 ft. deep. Only one shift of drillers was employed on each heading although a gang of muckers worked at night. The gangs consisted usually of four drillers, four muckers, one nipper and one shift boss. The muck was collected in dump cars running on a two-foot gage track, and was dumped at the end of the bench where it was picked up by the steamshovel with the rest of the spoil from the bench. The muck from the two interior headings was disposed of on the surface near the head of the shaft.

The progress in the headings was from 5 to 5½ ft. per day, while the progress of the shovels on the bench was about 4 ft. per shift, so that when working two shovels and two shifts a total progress of 16 ft. was made daily.

The bench was shot in two lifts of 8 ft. each, using three

Air Operated Shovel Picking Up Muck at the West Bench

holes 5 ft. center to center drilled from the top of each lift. These holes were drilled by jack hammers about 6 ft. back from the face, but the center hole was considerably closer to the face than the others. Any trimming was done with plug drills or jack hammers. The holes were first sprung with 10 to 12 sticks of 40 per cent gelatine after which they were charged with 20 sticks of the same explosive.

The Utah Construction Company, Ogden, Utah, which had the general contract for the entire Sherman hill section, carried on the work on three headings of the tunnel with its own men, employing an average of about 130 men. The Christensen Construction Company of Salt Lake City was the sub-contractor for the east heading and employed about 60

men. The supporting plant of the general contractor located west of the west portal of the tunnel consisted of five 100-hp. boilers, four Ingersoll-Rand compressors having a capacity of 500 cu. ft. of free air per minute, with pumps for the supply of water to drills, etc.

The tunnel was timbered as shown in one of the photographs with timbers used previously on tunnels on the Wahsatch work done the year before, but it was decided to replace the timber work with concrete just as soon as the shovels had completed the removal of the bench. The concreting was carried on from three concrete plants, one located above each portal and one at the head of the shaft. From these plants, concrete was spouted into small cars running on tracks at the level of the arch springing line, from which it was again spouted into the wall forms or shoveled into the arch. The tunnel work involved 36,000 cu. yd. of rock excavation and 10,000 cu. yd. of concrete.

The shaft was started in April, 1917, and the headings from the shaft in May, while the outside headings were started in June. The work on the double-track section outside the tunnel was also started in April and was all completed about September 26, except for a section a mile long through the tunnel. The track through the tunnel will be ready for service about mid-summer of this year, this being the last section of the double track to be placed in operation.

All of the new work on the double-track project including the tunnel work was carried on by the engineering department of the Union Pacific under the general direction of R. L. Huntley, chief engineer with W. S. Woodworth, engineer in charge; W. G. Tinney was resident engineer in charge of the work between Pine Bluff and Archer; H. C. Mann was in charge of the work west of Wamsutter, and F. W. Newhart has supervision of the tunnel construction. The track laying and ballasting was handled by the maintenance of way department under the direction of W. R. Armstrong, engineer of maintenance of way. The entire project was under the general supervision of E. E. Adams, consulting engineer of the Union Pacific System, New York City.

Orders Governing Western Regions

DURING THE PAST WEEK the following were among the orders issued to the railroads in the western regions: Supplement No. 2 to Circular 126, dated June 21, is in explanation of Supplement No. 1, which provided that no trains or other devices containing advertising matter for governmental activities be placed in passenger coaches. It was not intended by these instructions that advertising matter which had heretofore been displayed in coaches should be ordered removed, but rather that no additional advertising matter be displayed until a definite standard has been adopted.

A communication dated June 21, outlines the specifications for United States standard interchangeable electric headlight, which is being placed on all the standard locomotives recently ordered by the Railroad Administration. The blueprints and wiring diagrams are not yet available, but will be distributed shortly. Each headlight equipment will consist of one 500-watt, 32-volt turbo-generator, one micrometer lamp stand and one dimming device, the case to be air tight, round headlight case, No. 22 U. S. S. gage steel, with copper (32-oz.) triple-plated reflector, 18 in. in diameter and 9 in. deep, and an automatic circuit connector complete. The headlight will be of the incandescent lamp type, conforming to the requirements of the Interstate Commerce Commission in an order dated December 26, 1916. The socket for supporting the headlight will be located at the rear of the reflector and will support the headlight lamp in a horizontal position, so mounted that it can be moved in any direction with fine adjustment, to permit of focusing the headlight lamp and locking in any position. Suitable electric connections must be provided so that on removing the reflector from the headlight case the circuits will be broken automatically and, in replacing, it will be made automatically. A small unit incandescent lamp will be provided in the headlight case for illuminating the locomotive number. Headlight dimming resistance of rugged construction to withstand severe operating conditions will be provided with each turbine generator equipment.

Sub-committees of the San Francisco district freight committee have been appointed at Los Angeles, Cal., and Salt Lake City, Utah.

The city ticket offices of the railroads in Minneapolis and St. Paul will be consolidated. In the former city they will be located in the Office Equipment building and in the latter city in the Great Northern building.

Orders of Southern Regional Director

B. L. WINCHELL, regional director of the southern region, has asked the railroads in his territory to furnish at the earliest possible date, for the year 1918, an estimate of gross revenue, showing separately the customary items of traffic earnings and an estimate of traffic expenses.

A. R. Smith, traffic assistant to the southern regional director, in a circular letter says there exist among lines in the southern region both formal and informal agreements under which one or more of the parties thereto are given preferential treatment in the routing of traffic within the control of another. The circular states that it should be understood that under common operation these agreements must be disregarded if they conflict in any way with the efficient and economical transportation.

G. R. Loyall, assistant regional director, calls attention to the light loading of cars originating in some parts of the southern region, especially cars loaded with lumber, and asks the roads to have attention given to the loading in order to obtain the maximum capacity of the cars, in view of the fact that cars are being moved empty long distances to supply the demand for lumber loading.

Circular letter No. 266 authorizes the railroads to transport between points on their lines the railroad track scale testing equipment of the United States Bureau of Standards and to provide transportation for the authorized attendants accompanying them.

Circular letter No. 267 states that the question of new rail inspection is up for consideration. Railroads are asked to advise whether they have a department for rail inspection, whether they have a contract with R. W. Hunt & Company or other inspection concerns and, if so, the terms of the contracts and the dates of expiration, together with their recommendations as to what should be done in the matter.

In the interest of sanitation and for uniformity, the roads are directed to discontinue the use of aisle carpets on the floors of passenger coaches.

Revenue passenger trains are to be given precedence over special trains, according to a circular issued by G. R. Loyall. The circular says that in cases where a special train with officers is operated over the line, if it is the practice to have passenger trains take the siding, the practice should be discontinued as it is desired that passenger trains hold the main line.

The Railroad Administration is considering a reduction in the number of signatures required on vouchers. B. L. Winchell, Southern regional director, has issued a circular letter asking roads in his territory to furnish information as to their present practice with respect to approval of vouchers and asking for suggestions, based on experience, as to the least number of signatures necessary to insure ample protection.

Doings of the United States Railroad Administration

Standard Equipment Assigned to Roads. More Budgets Approved. New Freight Rates in Effect

WASHINGTON, D. C.

THE INCREASES IN FREIGHT RATES ordered by Director General McAdoo in General Order No. 28 went into effect on June 25 with the modifications published in the supplement issued on June 12 and in the order fixing specific export and import rates. Various changes of a minor character were also made by interpretations sent to the railroads by the division of traffic after complaints from shippers had been heard by Luther M. Walter, assistant director of the division of public service and accounting, and Paul P. Hastings of the division of traffic. They have also heard many complaints which will be referred for adjustment to the regional and district freight committees, who, as promised by the director general, will endeavor to work out a more satisfactory adjustment of rates on the higher level by maintaining existing differential and other relationships after the order is in effect. Mr. Walter and Mr. Hastings gave a hearing last week to the protests of the shippers of sand, gravel, brick, cement and crushed stone.

The higher rates are to be reflected in increased prices for many commodities. An announcement by the Price Fixing Committee readjusting the government prices for logs and lumber provides that any additional cost for log freight occasioned by the rate order is to be added to the prices fixed on logs so affected; the higher freight rates have also played a part in the discussion of iron and steel and wheat prices.

Fuel Administrator Garfield has issued a warning that prompt action will be taken against any dealer or distributor of coal who increases the price of fuel on hand to include the amount of the new increased freight rates and ordering that the increased rates may be included only in prices charged for coal upon which the higher rate actually has been paid.

The Interstate Commerce Commission issued an order extending for 30 days the time within which joint rates with railroads not under federal control may be filed, until July 26.

Express Contract Signed

The express contract between Director General McAdoo and the four principal express companies (Adams, American, Wells Fargo and Southern), the basis of which was announced by the director general on May 28, was signed by representatives of the express companies on June 21 and by Walker D. Hines, assistant director general, on the following day. The complete terms of the contract, which, as noted in last week's issue, were amended to provide for the reconveyance of the express properties to the individual express companies upon the termination of federal control, were communicated to the director general, who is in California, and received his personal approval.

The contract provides for the carrying on of the express business for all of the railroads under federal control, and the new express company now established, which will be known as the American Railway Express Company, will be the director general's agent for carrying on the express business. As announced on May 28, the character of the service and of the rates will be under the director general's control and subject to initiation by him. The contract will remain in force during the period of federal control unless previously abrogated. The contract provides that it can be cancelled by either side upon six months' notice after being in effect for four years.

Arrangements have also been made to have the new company take over the operation of the property of the Northern Express Company, the Great Northern Express Company and the Western Express Company, operating on the Northern Pacific, Great Northern and Minneapolis, St. Paul and Sault Ste. Marie railroads, respectively, whose property will be leased to the merger company because the Railroad Administration declined to make individual contracts with them.

Board of Adjustment No. 2

Railway Board of Adjustment No. 2 met in Washington on June 21 and organized by selecting E. F. Potter, of the Minneapolis, St. Paul & Sault Ste. Marie, as chairman, and F. J. McNulty, of the International Brotherhood of Electrical Workers, as vice-chairman. The board has designated the following dates as the beginning of each of its regular monthly meetings during the remaining portion of the year 1918; July 2, August 6, September 3, October 1, November 5 and December 3. W. S. Murrian, until recently superintendent of motive power of the Southern, has been appointed a member of the board succeeding W. F. Kaderly.

Change in Diversion and Reconsignment Rules

The car service section announces that in connection with tariff provisions affecting reconsignment and diversion, the Director of Traffic has instructed that the following clause be inserted under the heading of "Conditions" in Rules and Changes Governing the Diversion or Reconsignment of Carload Freight:

"Orders for diversion or reconsignment will not be accepted under these rules at or to a station or to a point of delivery against which an embargo is in force, or, except on perishable freight, coal, coke or fuel oil, to a station or to a point of delivery against which an embargo was in force at the time that the shipment was forwarded from point of origin. Shipments made under authorized permits are not subject to this condition."

This change will be made in the regular way on statutory notice, but in the meantime it is desired that all railroads shall issue the clause as an embargo making the provision immediately effective.

C. S. Lake has been appointed assistant to the director of the division of operation, to have general charge of the relations between the division of operation and the labor adjustment boards Nos. 1 and 2. He will co-operate with the boards and with the division of labo rto arrange for putting into effect promptly the rulings of the boards.

Assignment of Standard Equipment

The Railroad Administration has made an apportionment to the various roads under federal control of the 1,415 locomotives and 100,000 freight cars ordered by the Central Advisory Purchasing Committee. The apportionment is based on orders placed by the roads as revised by the regional directors and the officers of the central administration at Washington. It has been decided that the cars and locomotives will not be treated as the property of the government or as a "circulating reserve," as has been occasionally suggested, but they will be assigned to the railroads and will, of course, become their property in practically the same way as other equipment, although they will be subject to transfer to other roads when occasion requires. The federal manager of each road has been notified of the number assigned to it and asked to submit a formal requisition to the Division of Capital Expenditures, which has already

approved the budgets of the roads, including a total of $497,031,860 for equipment. This item, however, includes $36,959,423 for improvements to existing equipment, and $28,459,830 for passenger cars, and $12,970,109 for other equipment not comprised in the orders placed by the administration, as well as equipment proviously ordered by the railroads.

The financing of the equipment ordered by the government will be handled in the same manner as other capital expenditures, that is, the railroads will finance it themselves wherever possible and if necessary they may apply to the government, through the Division of Finance and Purchases, for a loan from the revolving fund.

The 1,415 locomotives include the original order for 1,025 and the additional order recently placed for 390 and are all of the standard types except that 30 of the Consolidation type for anthracite burning have been ordered for assignment to the Philadelphia & Reading.

The assignment of the locomotives is as follows:

Distribution of Standard Locomotives

Railroads	Assignment	Total
Light Mikado		
Baltimore & Ohio	100	
Chicago & Alton	15	
Chicago & Eastern Illinois	15	
Chicago, Indianapolis & Louisville	5	
Chicago, Milwaukee & St. Paul	50	
Chicago, Rock Island & Pacific	20	
Grand Trunk, East	15	
Grand Trunk, West	25	
Lehigh & Hudson River	4	
Long Island	6	
Nashville, Chattanooga & St. Louis	10	
New York Central	95	
Big Four	25	
Lake Erie & Western	15	
Michigan Central	20	
Pittsburgh & Lake Erie	10	
Pittsburgh, McKeesport & Youghiogeny	10	
Rutland	6	
Toledo & Ohio Central	15	
Oregon Short Line	20	
Pittsburgh & West Virginia	3	
Seaboard Air Line	10	
Texas & Pacific	11	
Southern	25	
Union Pacific	20	
Wabash	20	
Western Pacific	5	575
Large Mikado		
Central of New Jersey	25	
Chicago Great Western	10	
Elgin, Joliet & Eastern	2	
Erie	50	
El Paso & Southwestern	5	
Louisville & Nashville	20	
Missouri, Kansas & Texas	25	
Wheeling & Lake Erie	20	157
Light Mountain		
New York, New Haven & Hartford	10	
Southern	25	35
Large Mountain		
Chesapeake & Ohio	5	5
Light Pacific		
Atlantic Coast Line	20	
Baltimore & Ohio	20	
Kansas City Southern	3	43
Heavy Pacific		
Erie	20	20
Light Santa Fe		
Ann Arbor	4	
Boston & Albany	10	
Baltimore & Ohio	26	
Chicago & Western Indiana	5	
Duluth, Missabe & Northern	10	
Pennsylvania Lines West	30	
Southern	50	
Seaboard Air Line	15	150
Heavy Santa Fe		
Bessemer & Lake Erie	5	
Chicago & Eastern Illinois	5	
Erie	25	
Colorado & Southern	5	
Nashville, Chattanooga & St. Louis	10	50
6-Wheel Switch		
Atlantic Coast Line	5	
Baltimore & Ohio	20	
Chicago Great Western	5	
Chicago Junction	14	
Chicago, Rock Island & Pacific	10	
Central Railroad of New Jersey	10	
Grand Trunk Western	5	
Mobile & Ohio	10	
Oregon Short Line	5	
Pittsburgh & West Virginia	2	
Pennsylvania Lines West	20	
Seaboard Air Line	10	
Texas & Pacific	14	
Terminal St. Louis	10	
Union Pacific	10	150
8-Wheel Switch		
Atlanta & West Point	2	
Erie	16	
Elgin, Joliet & Eastern	8	
Georgia	2	
Kansas City Terminal	5	
Long Island	4	
Missouri, Kansas & Texas	10	
New York Central	25	
Big Four	10	
Indiana Harbor Belt	20	
Kanawha & Michigan	3	
Lake Erie & Western	3	
Michigan Central	10	
Rutland	2	
Toledo & Ohio Central	5	
Southern	20	
Wheeling & Lake Erie	5	150
Light Mallet		
Chesapeake & Ohio	20	
Chicago & Western Indiana	10	30
Heavy Mallet		
Virginian	20	20
P. & R. Standard Consolidation		
Philadelphia & Reading	30	30
Total	...	1,415

It is understood that orders for 50,000 additional cars, to include stock, refrigerator, general service and flat cars, are to be placed after the delivery of the first cars ordered is well along, from plans and specifications which have already been prepared by the car and locomotive standardization committee.

Locomotives to Work Their Way Home

The new locomotives turned out by the builders on orders placed by the government, and others to be delivered hereafter, will be required to work their way home, under steam and pulling a train of cars, according to a plan now under consideration by the Railroad Administration. The idea of imitating the practice that has grown up in the automobile and truck business, of driving new cars and trucks away from the factory instead of shipping them, has been recommended by Frank McManamy, manager of the locomotive section of the Railroad Administration, with the idea of making the locomotives do their bit en route to the roads to which they have been assigned, instead of being pulled in trains as in the past, in recognition of the fact that locomotives are no longer to be considered as merely the property of an individual road. It is estimated that this plan applied to 3,000 new locomotives a year would handle perhaps 500,000,000 ton miles of freight a year, by enabling each engine to haul a train, instead of itself occupying space in a train and exerting a dead weight equal to about three cars. The idea is to have the engines accompanied by a messenger from the locomotive plant, according to the usual practice, to look after the bearings, etc., during the trip, and to have them handled by regular crews of the roads over which they pass. It is believed that they will be delivered in better condition if used at the front of a train and given a thorough inspection at terminals than if handled in the usual way and that they may be "broken in" just as satisfactorily in this way as if the process were postponed until their arrival at the home road.

Freight Car No. 1

Although the completion of the first freight car of the government's order for 100,000 was announced last week by John Skelton Williams, director of the division of finance and purchases of the Railroad Administration, in the name of Director General McAdoo, there is thus far no news of car No. 2, or of the other 99,999 which are still to be built, and a considerable time may elapse before No. 2 arrives. Some curiosity was manifested by those who have been keeping track of the progress of the specialty orders placed by

Federal Managers and General Managers

A. T. Hardin
Assistant Regional Director, Eastern Roads

J. J. Bernet
General Manager, New York, Chicago & St. Louis

E. M. Rine
General Manager, Delaware, Lackawanna & Western

W. J. Harahan
Federal Manager, Seaboard Air Line

J. M. Hannaford
Federal Manager, Northern Pacific

W. P. Kenney
Federal Manager, Great Northern

W. J. Jenks
General Manager, Norfolk & Western

H. E. Byram
Federal Manager, Chicago, Milwaukee St. Paul

A. W. Trenholm
Federal Manager, Chicago, St. Paul, Minneapolis & Omaha

W. B. Wood
General Manager, Grand Rapids & Indiana

the Central Advisory Purchasing Committee, as to how the American Car & Foundry Company could have completed a car as announced at a time when the brake beams, side bearings and journal boxes had not yet been decided upon. We are informed that the car company had no inside information as to just what specialties to use on Car No. 1, but that from its standpoint the car represented merely the model, sample or pattern car, such as is usually turned out as the first of a large order, for inspection purposes, and might, therefore, be equipped with any specialties in stock, to be replaced later after the purchasing committee has finished its work and the ordered specialties have been built. No definite promises were made by the Railroad Administration as to the delivery of the cars. Its announcement of the first order simply stated that it was hoped the entire order would be completed in time for the fall and winter business. But when the locomotives were ordered, delivery was promised in July. A sample locomotive may be expected during the coming week, but deliveries are not expected until August.

Companies to Be Informed Regarding Capital Expenditures

In order to conform to the organization created by the appointment of federal managers and especially to afford railroad companies notice and timely information of the character and estimated cost of additions, betterments, terminals, road extensions, motive power, cars and other equipment made on or in connection with their properties during federal control, and also to invite the suggestions of the companies respecting such improvements, the Division of Capital Expenditures, Judge R. S. Lovett, director, has issued Supplement 1 to D. C. E. Circular No. 1, dated March 27, 1918, effective July 1, 1918, making the following amendments:

First: The monthly report to be made on D. C. E. Form 2 is to embrace projects involving a charge to capital account of less than $1,000 instead of $5,000 as required in D. C. E. Circular No. 1, this change commencing with the report for the month of July, 1918.

Second: The minimum amount to be reported on D. C. E. Form 3 is to be reduced from $5,000 as fixed in D. C. E. Circular No. 1, to $1,000, so that the projects to be reported on D. C. E. Form 3 shall be those involving a charge to capital account of not less than $1,000 nor more than $25,000.

Third: A monthly report of all work authorized during the month involving a charge to capital account of less than $1,000 for each project or job, should be made on D. C. E. Form 6, grouped by classes of work showing location, general description and amount chargeable to capital account only.

Fourth: No changes are made in D. C. E. Forms 1, 1-A, 4 and 5.

Fifth: (*a*) Four copies of D. C. E. Forms 1, 1-A, 2, 3, 4, 5 and 6 should be prepared by the federal managers.

(*b*) Two copies of D. C. E. Forms 1, 1-A, 2 and 5 should be sent direct to the director of the division of capital expenditures at Washington, one copy to the regional director and the other copy to the president of the company in whose name the forms are submitted. These copies are for information only and require no action.

(*c*) Three copies of D. C. E. Forms 3 and 4 should be sent to the regional director and one copy to the president of the company in whose name the forms are submitted.

(*d*) Two copies of D. C. E. Form 6 should be sent direct to the director of the division of capital expenditures at Washington, one copy to the regional director, and the other copy to the president of the company in whose name the form is submitted.

Sixth: The regional director should at once transmit to the director of the division of capital expenditures the original and one copy of D. C. E. Forms 3 and 4, retaining the other copy for his file and information. In case he approves without qualification, he should sign the forms accordingly. In case he disapproves, he should transmit with the form a memorandum of his views.

Seventh: D. C. E. Forms 3, 4 and 6, sent to the president of the company, are intended as notice to the company of the character of the work and the estimated cost thereof, and should be submitted by the president to the board of directors (or a committee of the board exercising its power) for its approval; and the president or the secretary of the company should promptly inform the director of the division of capital expenditures of the action of the board or committee, using D. C. E. Form 7. If for any reason the board or committee should object to the expenditures covered by these forms, the president or secretary should inform the director of the division of capital expenditures of the reasons therefor in order that such objections may receive attention before his final decision, and a copy of such letter should be sent to the regional director.

It is important that the board of directors or the committee act promptly upon all such reports, and that the president or secretary inform the director of the division of capital expenditures without delay, as work cannot be postponed pending advice of such action.

Eighth; When the expenditures covered by D. C. E. Forms 3 and 4 have been approved by the director of the division of capital expenditures, one copy of each form will be returned direct to the federal manager of the line, together with a letter of transmittal, listing thereon the forms returned by serial number and amount chargeable to capital account. A copy of this letter will be sent to the regional director as information to note on his copy of the forms the action taken by the division of capital expenditures. A copy will also be sent direct to the president as advice to the company of the action taken.

Ninth: In the event the director of the division of capital expenditures should decide that expenditures covered by D. C. E. Forms 3 and 4 should not be made or that the work for which the expenditures are requested should be deferred, one copy of the form will be returned to the federal manager of the line with a letter stating the reason for the action taken, a copy of which will be sent both to the regional director and to the president of the company for their information and record.

Tenth: It should be understood that the foregoing does not in any manner modify the authority given by General Order No. 12 issued by the Director General, March 21, 1918, to proceed with work which does not involve charges to capital account in excess of $25,000. All work within such limit may be contracted for and commenced subject to the conditions specified in paragraphs (*a*) and (*b*) of part fifth of such general order, without awaiting action of the board of directors or of the director of the division of capital expenditures.

More Budgets Approved

Additional budgets of capital expenditures for 1918 approved by R. S. Lovett, director of the division of capital expenditures, have brought the total up to $971,780,739 on June 24. This represents not only the budgets of additional railroads, but also some changes in those which had previously been approved. The total now includes $454,449,990 for railroads, but also some changes in those which had previo usly $20,298,869 for extensions. Through the approval of budgets, the Railroad Administration is able to eliminate competitive railroad building. Both in the case of terminal and branch line extensions approval has been withheld of expenditures on behalf of one railroad when the same service

could be performed by an existing facility or line of another railroad, except where the project was so near completion that it would be an injustice and cause a waste of money to stop it. One instance which has been made public where government control has been exercised to prevent a duplication of an existing line concerns a case where the Monongahela Railroad proposed to extend a line up the Monongahela river in West Virginia parallel to the Morgantown & Wheeling Railway. Work on the Monongahela extension was stopped in the fall of 1917, but when it applied for permission to continue the work this spring the application was approved by the regional director and by Judge Lovett. Later it was learned that the Morgantown & Wheeling Railway, which would be paralleled by the extension, could perform the service which would be performed by the new line for only a slight expense for rehabilitation and that its property would be injured by the construction of the new line, so the approval for the new extension was revoked.

Short Lines

A list of several hundred short line railroads, to be relinquished from federal control because the railroad administration does not consider them of sufficient value to warrant paying them a guarantee, is expected to be announced on July 1.

The fight of the representatives of short line railroads not to be relinquished from Federal control was transferred on June 24 to the Senate Committee on Interstate Commerce, which held a hearing on the resolution proposed by the Railroad Administration extending until January 1, the time during which control of any railroad may be relinquished. The short line representatives, who declared that many of them will be ruined if they are left to compete with the Government railroad system, have asked that the resolution be amended to provide that no line shall be relinquished while control of competing lines is retained. B. M. Robinson, president of the American Short Line Railroad Association, declared that the announced intentions of the Railroad Administration, as well as the resolution in the shape it was introduced, nullify the clear intention of Congress that the short lines should be retained. Ben B. King, of Dallas, Texas, and C. D. Cass, of Waterloo, Ia., members of the executive committee of the short line organization, also testified, saying that the proposal of John Barton Payne, general counsel of the Railroad Administration, to refrain from making contracts with short line railroads would destroy their credit, regardless of any promises made as to the Government's policy toward them. Mentioning the cases of the Gulf, Texas & Western, the Denver & Salt Lake and the Colorado Midland, they declared that the earnings had already been greatly reduced since the Government took control of the railroads because freight shipments have been diverted to other lines. The Government, they said, has refused to exercise jurisdiction over these lines since the managements of the roads have insisted on compensation based on the three-year average of net operating income, while the Government takes the position that this was made a maximum instead of a standard by the insertion of the words "not exceeding" in the railroad control law preceding the definition of the so-called standard return.

In testifying before the House Committee on Interstate and Foreign Commerce last week, General Counsel Payne of the Railroad Administration had stated that the regional directors have recommended the release of several hundred short lines, which, he estimated, it would cost the Government about $20,000,000 a year to retain on a basis of guaranteed earnings.

A committee of bondholders of the Denver & Salt Lake has issued a circular regarding its negotiations with the Government, stating that it was advised that the road had been relinquished after the Railroad Administration officials had proposed that the road be operated by the Government without compensation.

Members of Congress apparently are inclined to sympathize with the position taken by the short lines and Senator E. D. Smith, chairman of the Senate Committee on Interstate Commerce, is understood to have told the President on Tuesday that the resolution extending the time for deciding on the status of the short lines cannot be passed before July 1. This would require prompt action by the Railroad Administration in determining its policy. John Barton Payne and Walker D. Hines conferred with the President later in the day and there were indications that the Railroad Administration was speeding up its work in connection with the short lines preparatory to announcing its decisions.

Kansas City, Mexico & Orient to Be Taken Over

The Kansas City, Mexico & Orient, regarding which there has been some uncertainty as to whether it would be retained under Federal control or relinquished with the short lines, has agreed tentatively upon a contract with the Railroad Administration for compensation. The plan provides for the payment of $150,000 to meet the interest on the receivers' certificates and a division of the net operating income between the Railroad Company and the Government, with an option to the Government to commute this into a payment of $350,000 a year after an experience of six months. It was understood at one time that it had been decided to relinquish this road and a large delegation of people from the territory traversed by the line came to Washington and asked that the road be taken over.

McManamy Appointed Mechanical Assistant

Frank McManamy has resigned as chief inspector of locomotive boilers of the Interstate Commerce Commission and has been appointed mechanical assistant to the director of the Division of Operation of the Railroad Administration, effective on July 1, succeeding H. T. Bentley. In this position he will have jurisdiction over the Car Repair and Inspection and Test Sections and general charge of matters pertaining to locomotive and car equipment. Mr. McManamy has also been manager of the Locomotive Section of the Division of Operation, having charge of locomotive maintenance while Mr. Bentley was in charge of the work of standardization of locomotive and car design.

F. A. Delano Resigns

F. A. Delano, member of the Federal Reserve Board and former president of the Wabash, has tendered his resignation to the President to accept a commission in the army engineer corps, for railroad service in France. His resignation has not yet been accepted.

Uniform Classification Committee

The Uniform Classification Committee submitted its report to the Interstate Commerce Commission on Wednesday and the commission will hold a series of hearings on it.

Exports Control Committee

The exports control committee organized at a meeting on Wednesday by electing as chairman George D. Ogden, freight traffic manager of the Pennsylvania Railroad and representative of the railroad administration. The committee will have offices in both Washington and New York.

INCREASED RAILWAY FARES IN IRELAND.—The recent increase in ordinary passenger fares by 50 per cent on the railways in Great Britain was ordered to apply to Ireland from June 1.

Canadian Northern Stock Valued at $10,800,000

AFTER SITTING 50 DAYS in March, April and May, taking over 1,500,000 words of evidence and filing 211 exhibits, an arbitration board consisting of Sir William Meredith, chief justice of Ontario, representing the Canadian government; Wallace Nesbitt, K. C., of Toronto, representing Mackenzie, Mann & Co., and Chief Justice Harris of Nova Scotia selected as the third member, gave a unanimous award on May 25, placing a value of $10,800,000 on the 600,000 shares of Canadian Northern capital stock.

The agreement under which the arbitration was held was made on October 1, 1917, by the king, represented by the Ministers of Finance and of Railways and Canals, Mackenzie, Mann & Co., Ltd., and the Canadian Bank of Commerce. In accordance with an act passed in the 1917 session of the Dominion parliament providing for the acquisition of the Canadian Northern stock, the arbitrators were selected to determine the value of 600,000 shares as of October 1, 1917. In arriving at their decision they were authorized to consider the reproduction cost new of the railroad but not to include therein any increase in value of labor, material or of property due to the war. It was agreed that if the value of the stock was found to total $10,000,000, or more, the price to be paid therefor would be that figure, but if the value ascertained should reach less than that amount the value so determined would be the price paid by the government. It was also understood that the arbitrators' decision would be final, if unanimous, and that the price determined would be paid by the government within three months from the receipt of the award, less its proportionate share of the amount of any liabilities ascertained by the government to be outstanding against the railroad and undisclosed to the arbitrators. No deductions were to be made for liabilities properly chargeable to capital account unless the corresponding value produced thereby had been taken into consideration as an asset of the company.

In their decision the arbitrators admitted that the problem before them was one of great difficulty and subject to a great diversity of opinion. While the ascertainment of a surplus of assets over liabilities or the reverse is not a conclusive test of the value of stock, it is an element which cannot be ignored and which engaged much of the time and consideration of the board. After finding the reproduction cost of the physical property based on pre-war prices and making due allowance for depreciation and land grants, the arbitrators found the surplus of assets over liabilities of the company on October 1, 1917, to be not less than $25,000,000. The board pointed out, however, that the valuation of physical property of a railway by the reproduction new method, less depreciation, is not to be regarded as the ascertainment of the real value, but is only a means to that end and, in fact, the only estimate available. Among the other considerations entering into the valuation were the prospective earning power of the company, its past earnings and expenditures, its present financial position, the location of the lines and their construction, the other railways already existing in competition, the rate of interest on the company's funded and other debts, and the probable future growth of the population and business of the country.

The $10,800,000 award places a value on the 600,000 shares of the Canadian Northern at $18 each, but as the amount to be paid for the property was limited by the agreement to $10.000.000, the value per share according to the decision was $16.66.

LONDON-PARIS MAIL BY AIR.—An aerial postal service between London and Paris has been inaugurated.

Rail Production in 1917

THE AMERICAN IRON AND STEEL INSTITUTE, New York, has issued a special bulletin giving the production of rails during 1917 as compared to previous years, since 1902 inclusive. According to the table given below, the production of rails in 1917 was 2,944,461 tons, or larger by 110,000 tons than in 1916. However, when the totals are considered in the light of the exports of rails during those two years, it will be seen that the consumption of rails in this country was considerably less than in 1916. During 1917 almost one half a million tons of rails were exported by the United States Government alone for the use of the army in France. Another notable fact shown by the table is that the relative production of Bessemer rails has increased since 1915. In 1917 it represented 18.11 per cent of the total production as compared to 15.42 per cent in 1916 and 14.83 per cent in 1915.

PRODUCTION OF RAILS BY PROCESSES, IN GROSS TONS

Years	Open-hearth	Bessemer	Rerolled*	Electric	Iron	Total
1902	6,029	2,935,392	.....	.....	6,512	2,947,933
1903	45,054	2,946,756	.....	.....	667	2,992,477
1904	145,883	2,137,957	.....	.....	871	2,284,711
1905	183,264	3,192,347	.....	.....	318	3,375,929
1906	186,413	3,791,459	.....	.....	15	3,977,887
1907	252,704	3,380,025	.....	.....	925	3,633,654
1908	571,791	1,349,153	.....	.....	71	1,921,015
1909	1,256,674	1,767,171	.....	†	.....	3,023,845
1910	1,751,359	1,884,442	.....	†	230	3,636,031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	.....	3,327,915
1913	2,527,710	817,591	155,043	2,436	.....	3,502,780
1914	1,525,851	323,897	95,169	178	.....	1,945,095
1915	1,775,168	326,952	102,083	.....	.....	2,204,203
1916	2,269,600	440,092	144,826	.....	.....	2,854,518
1917	2,292,197	533,325	118,639	.....	.....	2,944,161

*Rerolled from old steel rails. Included wiith Bessemer and open-hearth steel rails from 1901 to 1910 inclusive. †Small tonnages rolled in 1909 and 1910 but included with Bessemer and open-hearth rails for these years.

Another table shows the production of renewed and rerolled rails for 1911 to 1917 inclusive, from which it is seen that in spite of the demand for rails there has been a further reduction in the practice of rerolling old material, the total being only 127,646 tons in 1917 as compared to 148,686 in 1916 and the maximum tonnage of 198,836 tons in 1913.

PRODUCTION OF RENEWED AND REROLLED RAILS, 1911-1917

Years	Rerolled from new seconds, new defective rails, etc. Open-hearth	Bessemer	Total	Rolled from old rails	Total rerolled
1911	2,631	19,379	22,010	91,751	113,761
1912	13,740	29,446	42,586	119,390	161,976
1913	13,052	30,741	43,793	155,043	198,836
1914	13,538	13,234	26,772	95,169	121,941
1915	6,477	2,652	9,129	102,083	111,212
1916	1,711	2,149	3,860	144,826	148,686
1917	1,825	7,182	9,007	118,639	127,646

Further insight into the deficiency of rail production is to be found from the table giving the production of rails by weight per yard. Here it is seen that for 1917 the rails weighing 85 lb. and less than 100 lb. amounted to 989,704 tons and rails weighing 100 lb. and over aggregated 763,526 tons or a total of 1,753,230 tons in the weights of rails commonly used for renewals on important lines. This compares with 1,992,192 tons for 1916.

PRODUCTION OF RAILS BY WEIGHT PER YARD, 1902-1917

Years	Under 45 pounds	45 and less than 85	85 and less than 100	100 pounds and over	Total Gross tons
1902	261,887	2,040,884	645,162		2,947,933
1903	221,262	1,603,088	1,168,127		2,992,477
1904	291,883	1,320,677	672,151		2,284,711
1905	228,252	1,601,624	1,546,053		3,375,929
1906	284,612	1,749,650	1,943,625		3,977,887
1907	295,838	1,569,985	1,767,831		3,633,654
1908	183,869	687,632	1,049,514		1,921,015
1909	255,726	1,024,856	1,743,263		3,023,845
1910	260,709	1,275,339	2,099,983		3,636,031
1911	218,758	1,067,696	1,536,336		2,822,790
1912	248,672	1,118,592	1,960,651		3,327,915
1913	*270,405	†967,313	2,265,062		3,502,780
1914	*238,423	†309,865	868,104	528,703	1,945,095
1915	*254,101	†518,291	742,816	688,995	2,204,203
1916	*295,535	†566,791	1,225,341	766,851	2,854,518
1917	*303,258	†882,673	989,784	763,526	2,944,161

*Includes rails under 50 pounds. †Includes 50 pounds and less than 85 pounds.

70-Ton Side Dump Hopper Cars Built by E. J. & E.

Center Sill Is Not Continuous; The Floor Members Are Arranged to Withstand Buffing Stresses

THE ELGIN, JOLIET & EASTERN is building in its shops at Joliet, Ill., 500 steel hopper cars. These are of the side dumping type and have a rated capacity of 140,000 lb. and a cubical capacity of 2,533 cu. ft. The length over the end sills is 41 ft., the maximum width

Center Sills and Bolster Assembled and Placed on Truck

is 9 ft. 10¾ in., and the maximum height of the car body is 11 ft. The average light weight is 57,500 lb.

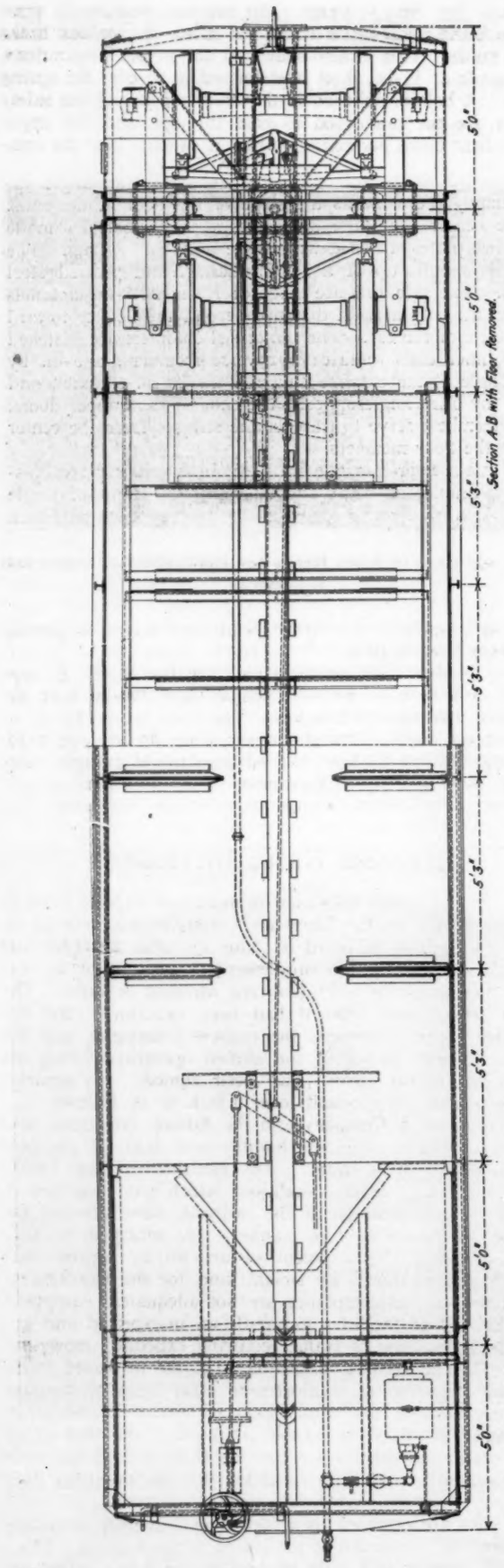
One of the unusual features in the design is the way in which the floor members are made to serve as a part of the underframe. The center sills are not continuous from end to end, but extend only a short distance beyond the ends of the hopper openings. They are each made up of two 15-in. 40-lb. channels tied together at several points, each of the four channels being 12 ft. 5 9/16 in. long. The ends toward the center of the car are cut at an angle approximately the same as the slope of the floor at the ends. At the center plate the sills pass through bolsters made up of two plates stiffened with angle irons and Z-bars. The end sill is built up of a 12-in. channel and pressed steel shapes. The side sills are made of 12-in. 20.5-lb. channels and extend only a short distance beyond the bolster toward the middle of the car. The center sill channels are fastened at the inner ends to three transverse members, a 3-in. by 3-in. angle at the extreme end, a 9-in. 20-lb. channel, and a 6-in. by 6-in. angle opposite the ends of the hopper doors. These members serve to transfer the stresses from the center sills to the floor members.

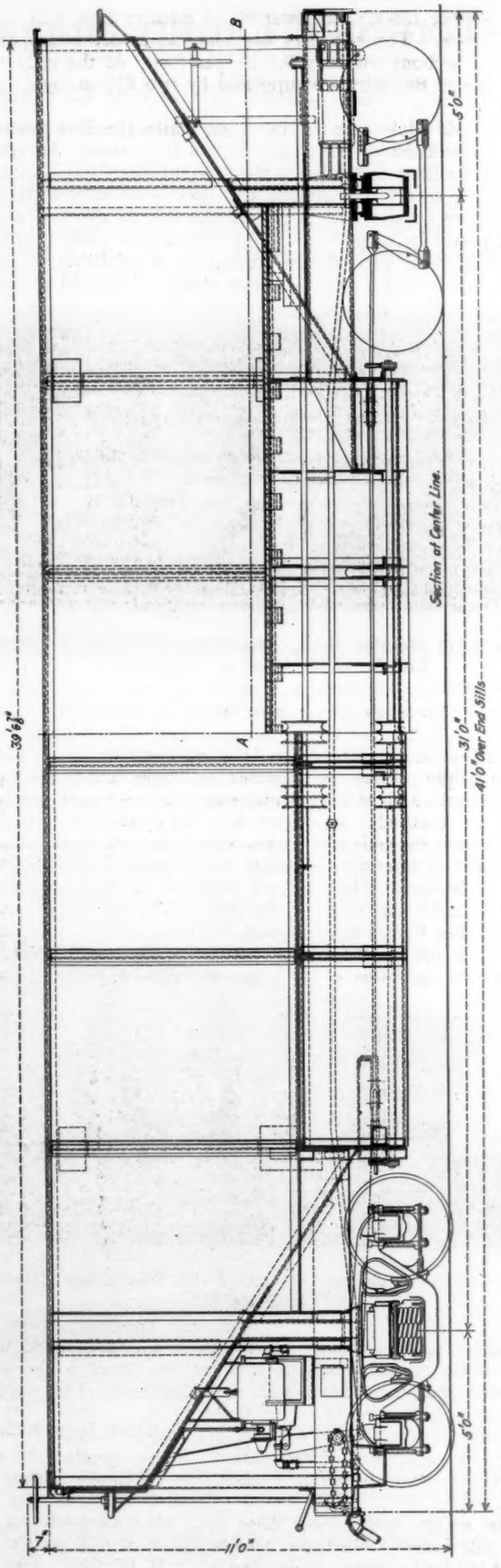
The main floor is made up of 5/16-in. floor plates fastened to numerous transverse A-frames built up of angle bars. Along the lower edges of the floor on each side is a 3-in. by 4-in. angle and at the top ridge there is fastened a 4-in. by 4-in., 18.5-lb., 100-deg. angle. This angle extends to the bolster while the main floor and sloping end are joined about two feet from the bolster. The end of the top angle is attached to two bent plates with angles at the lower ends, these angles being riveted to the upper flanges of the center sills. The main floor member is further stiffened by the runway, which is a 7-in. channel, fastened to the floor by numerous pressed steel supports.

There are three openings in the floor on each side to allow the links of the door mechanism to pass through. At each of these points the floor is stiffened with angles and the plates which form the openings for the door arms are used to support gusset web plates which serve to stiffen the sides.

The sides are designed as girders and arranged to assist in transferring the weight of the lading to the bolsters. The top chord member is a bulb angle 4-in. by 3-in., weighing

Elgin, Joliet & Eastern Hopper Car





Plan and Elevation of E. J. & E. Hopper Cars

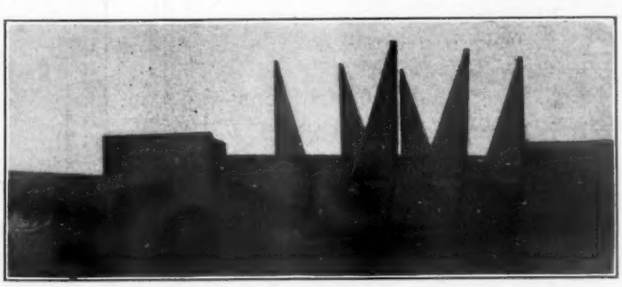
11.9 lb. per foot. The lower chord member is a 4-in. by 3-in. angle. The stiffeners opposite the gusset plates are cross-tie sections weighing 9.5 lb. per foot. At the ends of each bolster the sides are supported by two 2½-in. by 3-in. angles.

The side plates are ¼ in. thick while the floor plates have a thickness of 5/16 in. It has been found that the life of the floor and sides is about equal when these thicknesses are used. The sloping end floor sheet extends from the hopper up over the bolster to the end of the car, and is supported by angle irons. The vertical end plate is supported by four pressed steel end posts in addition to the angle iron corner post. The end sheet is stiffened at the

Main Floor Member Being Assembled. Note Extension at End for Attachment to Center Sills

top by a bulb angle of the same section as that used on the sides.

The dump doors are 20 ft. 11½ in. long and 2 ft. 10½ in. in height. They are stiffened by angles along the top and bottom, and at the points where the operating mechanism is attached. There are five links attached to each door, two at the ends which pass outside the hopper opening, and three at intermediate points which pass through openings in the floor. The links are connected to arms on shafts carried under the sides of the floor. The links are bent so that they have a toggle action, and are self-locking when the doors are in the closed position. The shafts which control the operation of the doors are attached to the main



Ends and Floor Section Assembled and Side Gusset Straps in Place

operating shaft by chains. Two turn-buckles are placed in each chain to allow the position of the shaft to be so adjusted that both doors will close together. The main operating shaft extends under the floor to the end of the car, and is controlled by a hand wheel and chain attached to an arm on the end of the shaft. The arrangement of the dumping mechanism is clearly shown in one of the illustrations.

The trucks used under these cars have Andrews cast steel side frames, rolled steel wheels, Simplex truck bolsters and Ajax brake beams conforming with the M. C. B. specifications for No. 3 beams. An unusual feature of these trucks is the combination brake rod safety hanger and brake beam guide. This is also shown in one of the illustrations. It is made of ½-in. sheet steel formed to fit over the spring plank. A hole is punched in the lower portion of the safety hanger for the brake rod to pass through, and the upper end is bent down horizontal so that it extends over the compression member of the brake beam and serves to prevent the beam from tipping.

Sides and Ends in Place Ready for Application of Doors and Appliances

The couplers used on these cars are the M. C. B. type D No. 5 with 6-in. by 8-in. shanks and 9⅛-in. butt, attached to the yoke with a key. The yoke is of 1¼-in. by 5-in. wrought steel. The draft gear is the Miner type A-18. Westinghouse air brakes are used with the K-2 triple valve and a 10-in. by 12-in. air cylinder.

Express Rates Increased

A 10 PER CENT INCREASE in interstate express rates is allowed by the Interstate Commerce Commission in a decision rendered on June 22, after an order had been issued denying the supplementary petition of the express companies for a 15 per cent increase in rates. The orders were issued after it had been announced that the amended contract between the express companies and the director general providing for unified operation during the period of federal control had been signed. An abstract of the opinion by Commissioner Clark is as follows:

Wells Fargo & Company and the Adams, American, and Southern express companies handle more than 95 per cent of the total express traffic. The evidence in their behalf shows that many of the conditions which have operated to reduce the net earnings of the railroads have affected the express companies in like manner; that emergencies have made necessary the shipment of articles by express that heretofore have moved by freight, and for the handling of which the express companies are not adequately equipped; that the lack of facilities to handle an unexpected and unprecedented volume of traffic requiring expedited movement has resulted in serious congestion; that the increased traffic and the attraction of employees to other lines of business have necessitated the employment of many inexperienced men and the use of unsuitable equipment; and that under these conditions the service has deteriorated and the ratio of operating expenses to revenues has increased to such an extent that their aggregate earnings on domestic traffic under the present rates are insufficient to meet operating expenses.

By far the largest item of operating expense, after de-

ducting payments for express privileges, is that of labor, and there have been very heavy increases in labor costs. Charges for maintenance, and stable and garage expenses have largely increased. So also have payments on account of loss and damage claims because of the congestion, the shortage of suitable equipment, the careless or inefficient work of inexperienced employees, and the increased value of the shipments. It is unnecessary to discuss in detail these and various other conditions shown of record. Their existence is conceded; the necessity for corrective measures is obvious and imperative; and it is urged that relief from their untoward effect upon the applicants' service and revenues can be obtained only by increasing the rates, inasmuch as all possibilities in the way of operating economies have been exhausted. We will, therefore, proceed to consider the evidence relating to the financial conditions of these carriers and the probable effect upon their revenues of the proposed increased rates.

Wells Fargo & Company

Wells Fargo & Company's operating revenue increased from $12,945,464 for the first seven months of 1916 to $15,514,000 for the same period of 1917, but its operating income decreased from $1,238,761 to $137,250. Substantial deficits occurred in January, February, June and July, 1917. Had all its rates on state and interstate traffic been 10 per cent higher than they were its operating income for the period would have been $1,445,847.

American Express Company

The American Express Company's operating revenue increased from $17,293,759 for the first seven months of 1916 to $20,968,190 for the same period of 1917, but its operating income decreased from $1,080,538 to a deficit of $96,796. Deficits occurred in the same four months as in the case of Wells Fargo & Company. Had the rates of the American Express Company on all traffic been 10 per cent higher than they were its operating income for the period would have been $1,725,191.

Adams Express Company

The Adams Express Company's operating revenue increased from $12,838,524 for the first seven months of 1916 to $14,886,907 for the same period of 1917, but its operating income decreased from $546,914 to a deficit of $1,173,188. March was the only one of the seven months of 1917 in which it did not operate at a deficit. Had all its rates been 10 per cent higher the operating income for the period would have been $209,521. The net operating results of the Adams Express Company for the first seven months of 1917 were much more unfavorable than were those of any other company. This was due in part at least to the fact that the greater proportion of its business is in the east and on lines where the unusual conditions were earlier encountered and more severely felt.

Southern Express Company

The Southern Express Company's operating revenue increased from $4,774,852 for the first seven months of 1916 to $5,377,990 for the same period of 1917. If there be included as a deduction from net operating revenue the sum of $150,000 which this company estimated it must pay as normal income tax and war tax, its operating income for the first seven months of 1917 was $624,206, or $185,274 less than for the same period of 1916. The exhibits filed by this company indicate a deficit of $35,003 for the month of July, but this amount was shown to be $28,571 more than it should have been, because the tax item of $150,000 was apportioned only to the months of May, June, and July instead of to the entire seven months' period. Without deducting these taxes, the Southern Express Company had an operating income for July of $14,996 and of $774,206 for the seven months' period. Had all its rates been 10 per cent higher than they were its operating income for the period, with war taxes deducted, would have been $1,063,670.

The data submitted by all the applicants include deductions representing normal income tax and war tax, but except for the Southern Express Company the amounts are so small as not materially to affect the result.

The Four Companies Collectively

Considering the four companies as a unit, their operating revenue from domestic transportation was $47,852,600 for the first seven months of 1916 and $56,747,089 for the same period of 1917, but their operating income decreased from $3,675,694 to a deficit of $508,527. The deficit would have been approximately $321,776 but for the inclusion of income and war taxes. Deficits occurred in the months of January, February, June, and July. Had all the rates of the four companies been 10 per cent higher, their operating income for the period would have been $4,444,231.

Other Express Companies

The smaller express companies, except the Canadian, showed substantial increases in operating income. The figures for the first seven months of 1916 and 1917, which include the net income derived from their foreign and nontransportation business, are stated below:

	Great Northern.	Northern.	Western.	Canadian.
1917	$147,470	$177,377	$55,864	$77,900
1916	91,796	137,902	34,752	140,423

The Situation as of December 31, 1917

During the remaining months of 1917, and for that year as a whole, reports filed with the commission show that the net operating results were much more unfavorable than during the seven months' period ended July 31.

Excluding war taxes and the net income derived from the foreign and nontransportation business, it is estimated that the net operating results from the domestic traffic of the four principal companies were as follows:

Operating income or deficit

	August to December, 1917	Calendar year 1917
Adams	*$2,237,697	*$3,410,885
American	*183,764	*280,560
Southern	345,519	1,119,726
Wells Fargo	*117,707	56,294
Total	*$2,193,649	*$2,515,425

*Deficit.

Conclusions

It is apparent that the Adams, the American, and the Wells Fargo companies, which together transact about 86 per cent of the total express business, and that the smaller companies, in a somewhat lesser degree, require the additional revenue which the proposed increased rates would yield to enable them to afford adequate service and to meet the constantly increasing costs of operation. Accepting as approximately correct the estimated additional revenue which the increased rates will yield, it is far from certain that, under a continuance of present separate operation, it would be sufficient to offset the increases in wages and other operating costs.

The protests against the proposed increased rates are comparatively few and relate principally to those of the Southern and the smaller express companies. It is unnecessary, however, to particularly consider the revenues or rates of each individual carrier. In the former proceedings, 24 I. C. C., 380; 28 I. C. C., 131; and 35 I. C. C., 3, these express companies were treated substantially as a unit. And, as is well known, they have recently been merged into one company, which will be operated as an agency of the government under

a contract with the United States Railroad Administration.

Upon all the facts of record we conclude and find that the application should be granted. An order will be entered accordingly.

Commissioner Aitchison in a dissenting opinion said in part: "What is said in the majority report as to the increased cost of performing express service is undeniable. But it is clear from the record that the increases in costs are far heavier in Zone 1, which embraces roughly the territory east of the Mississippi and north of the Ohio and Potomac rivers. The density of traffic and population is greater and the general rate basis is lower in this zone than elsewhere in the country. The added costs are much greater on less-than-carload than on carload traffic, and on small than on large packages or articles.

"It is entirely feasible to adjust the express schedules so that the burden of these additional costs shall be borne in the sections where such added costs are incurred, and by the kinds of traffic which have caused the increased expense; but this is not done. Instead, the burden is laid upon all kinds of traffic, and is imposed in relatively heavier degree upon localities already carrying the highest rates and which are not responsible for the greatest part of the added financial burden of these carriers."

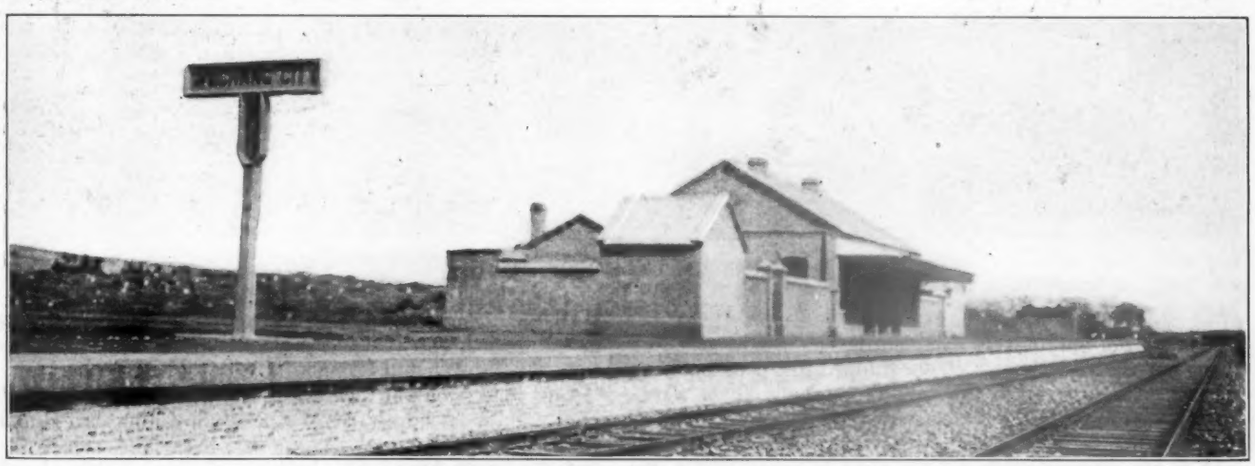
The new rates are to be established on not less than five days' notice.

The Chinese and Japanese Railways Compared*

Japan's Lines Have a Semi-Military Organization. China Is Hardly Master Over Its Own Railways

By Frank Rhea

CHINA HAS ABOUT 6,500 miles of railroads today, of which 2,300 are what I call concessioned railways—really nothing more or less than other governments operating railways in China. There are almost 3,800 miles of the Chinese government railways which I will refer to later. In Japan there are about 6,000 miles of the Imperial Government Railways of Japan which is one of the best examples of government ownership in existence today. The three railway situations in the world which can be put in parallel columns and the performance figures studied most interestingly are America, Japan and Germany. The performances of the Japanese railroads are quite remarkable in a number of respects. They have a very light goods wagon with a capacity of 10.6 tons. Those goods wagons each move 110,000 ton miles a year while the American railways move about 160,000 ton miles a year in cars of 41 tons capacity. Therefore, we have quite a number of things to learn from the Japanese railways.



A Station on the Canton-Hankow Line

A Semi-Military Management

The Japanese railways are organized on the British departmental basis with a Germanized semi-military management superimposed on top of it. That, to me, answers whether we wish to take up that method of railroad organization. If we want to get the German or the Japanese efficiency, we will have to superimpose the semi-military organization. One goes with the other.

Japan is a very rough country. The lines are 3 ft. 6 in. gage; the grades are steep, the curvature is sharp and the railroads have cost practically $90,000 in gold per mile for the Japanese government to acquire. It did not cost quite that to build them; it includes some of the profit to the former owners, who were private individuals.

The Japanese railways were bought through a rather peculiar business transaction which is a long story, but which resolves itself down to a brief statement that the earnings for a period of years were multiplied by 20, which capitalized the earnings at 5 per cent.

For several years the Japanese have made a very careful effort to manufacture their own railway equipment requirements. In 1910 they bought about 20 per cent of the requirements out of the country. In 1914 they reduced this

*From a paper read before one of the group sessions of the National Foreign Trade Convention at Cincinnati in April. Mr. Rhea visited Australia and the Far East as a commercial agent of the Bureau of Foreign and Domestic Commerce to investigate the markets there for American railway materials. An abstract of his report on Australia and New Zealand appeared in the *Railway Age* of March 22. His report on China and Japan is in press.

to less than 5 per cent. They have since gone up to about 12½ per cent. Manufacturing in Japan is typically along the line of private manufacturing. The two plants which are most important today in the manufacture of railway equipment are the Osaka Locomotive & Car Works and the Kawasaki dock-yards, both of which have modern and moderately well equipped plants. They have been fostered by long-time contracts for both locomotives and carriages for the Imperial Government Railways.

With an adequate supply of labor and materials (both of which are very short in Japan today) these two plants can turn out about 250 locomotives a year, about 1,250 passenger cars and 6,000 to 7,000 goods wagons, in addition to a considerable amount of other materials, fabricated structural materials, shop machinery, etc. The wages at both these works have been substantially increased since the war. At present common labor costs from 25 cents to 50 cents gold a day. The wages of mechanics range from 50 cents to $2 a day. This was an undreamed of wage for a Japanese mechanic previous to the war.

The Japanese in China

Probably the most serious situation in the long run of Japanese development is in China, particularly in Manchuria and probably later Shantung, as illustrated by the Shakado works of the South Manchuria railways at Darien, which are not only a very complete layout of railway work shops but are as well completely equipped for manufacturing general engineering products. In recent years these works not only furnished fabricated structural materials needed by the Japanese in their developments in South Manchuria, such as the Thiazin color and the Penhiha iron furnace, the Anshan steel plant now in construction, but have as well sent back to Japan structural material, machinery for locomotives to Indo-China, and have built considerable equipment for the Korean and Manchurian railways.

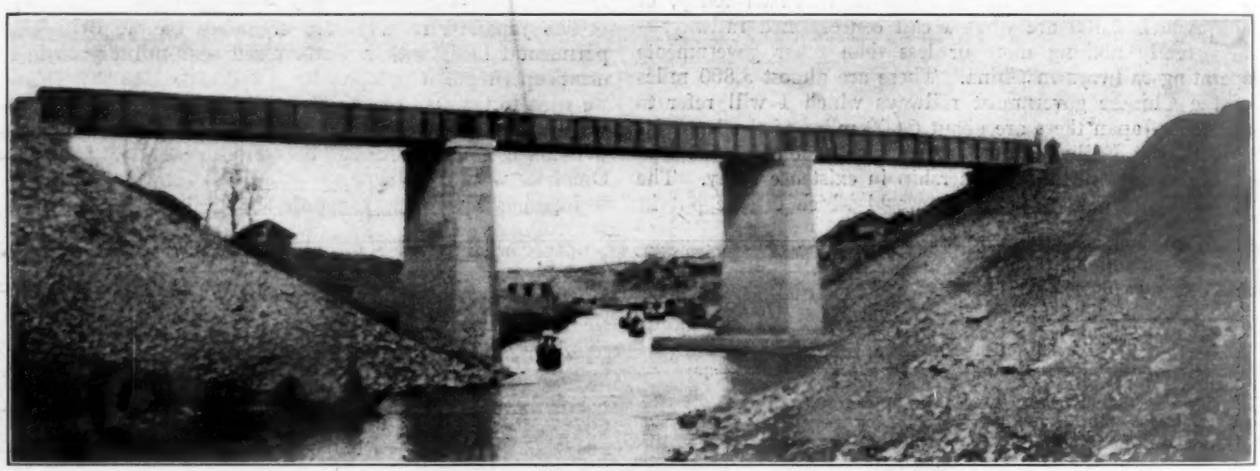
I visited the Shikoku works where there were about 4,150 men employed, of which over 80 per cent were Chinese, principally the upstanding, robust men from Shantung who make excellent mechanics if properly developed and properly supervised and directed. These same remarks apply to the other works in South Manchuria and also in Japan.

It looks to me that one of the serious matters we have to consider in the Far East is not so much what Japan will do in Japan proper as what she will do in China and we have to face the fact that the Japanese are the one yellow race which has administrative and organizing ability and initiative. I don't know whether it's initiative, but they do it just the same and the Japanese in the Shikoku works are all administrative and tactful. Every trained man, every engineer, is a Japanese and the Japanese apparently are very much interested in seeing that the Chinese keep busy.

An interesting problem in that connection was my study of the Tungshang works of the Peking-Mukden Railway which have at the present time about seven Britishers running the works and I was interested as to why the Tungshang works could not get the results that the Shikoku works did. I concluded it was very largely for the reason that they did not have somebody in each one of those positions—a crane man, an engine man, or whatever it might be—that kept things going. Those seven Britishers had about half their time occupied in the administration of the railroad itself and could not put the push into the Chinese.

The South Manchuria Railway

We have looked on the South Manchuria Railroad as a private corporation. It is, so-called. As a matter of fact, the South Manchurian Railway is directly under the administration of the Colonial Department of the Government of Japan. It is actually the instrument of Japan in handling the investigation, development, manufacturing and transportation organization of Manchuria. We always talk in this country of the big part of the United States being Texas. Well, Manchuria is equal to Texas with Louisiana and Arkansas added, and is equal pratically to the four Northwest states of Washington, Oregon, Idaho and Montana.



On the Canton-Hankow Railway

The concession railways of China constitute the French-Hunan lines extending from French Indo-China into Hunan, the ex-German Shantung lines now in the hands of Japanese, and the South Manchuria Railway already mentioned. In addition there is the Chinese Eastern Railway crossing Manchuria about which much has been said recently but which really can be left without further mention on account of the present chaotic condition in that part of the Far East, because Manchuria is China and not Russia.

There are about 1,100 miles of this line, of which over 900 miles constitute part of the trans-Siberian route. There is 152 miles in a branch from Harbin to Chang Sha, where connection is made with the Japanese South Manchuria line. This line runs through a very fine agricultural country with a great deal more live stock than is the average in all the rest of China.

Of all the situations in this part of the world, I think we are most interested in the Chinese Government railways, and I speak of this as Chinese Government railroads advisedly. These are administered by the Chinese Ministry of Com-

munications and remarkable progress has been made notwithstanding the great difficulties which have taken place in China in the last few years in nationalizing these railways and I use the word nationalizing advisedly.

I went to China quite of the opinion that we had little chance to get anything but the small amount of business on account of the concessions to the other countries. Without doubt the Chinese railroads are very real examples of business following investment and unless we go after both the investment and the business, it will remain so in many ways.

There are, however, features which I do not understand which, in my opinion, may mean much to us in the future if taken advantage of. First, everyone seems to have taken it for granted that the principal problem was to build railways in China, but I was struck with the similarity of the problem from the one we have at home and which we are suffering from in America, that the real problem is to furnish the ultimate capital to develop the railways of China after they have settled down and know about what they can do. It is not only the problem of first building the railways but it is a large problem to furnish the capital and additional equipment to go ahead and bring those railways to the ultimate development, and the ultimate development of the railways in China is certainly going to be very interesting on

Japanese Troops in Possession of the German-built Railway at Tsing-Tao

account of the character and density of traffic which will ultimately develop.

Chinese Railways Lightly Equipped

Today the Chinese railways are very lightly equipped as we see it in America. With earnings of approximately $20,000 Mex. per mile of line they have .2 of a locomotive per mile, .4 of a passenger car per mile and ¾ of a goods car per mile of line. The Japanese, with earnings not greatly different, have .4 of a locomotive, 1.2 passenger cars and 7.6 goods wagons while we in America have ¼ of a locomotive, .45 of a passenger car and 9.8 freight cars, all very much larger than the Chinese. Germany in 1913, with earnings of $22,000 gold per mile, had ¾ of a locomotive, 2¼ passenger cars and 17½ goods wagons, all larger than the Chinese.

The Chinese are making five complete loadings of goods wagons a month, some lines making six complete cycles of loading of a goods wagon a month, and moving a haul of about 146 miles. Americans with a haul of 260 miles make a loading of a little over two a month. The Japanese are loading about four and a half times, I believe, although I was not able to get very definite figures on that feature.

Therefore, the transportation problem of the Chinese railways today is a very interesting one and one of the great difficulties is that they have superimposed on them some 12 loan restricting ideas tying the Japanese' hands as to making the railroads a consolidated whole. This control by the Ministry of Communications is losing its effect to a certain extent by the amortizing of the loans and the Chinese gradually taking hold of it but that has a long time to run and they are needing all the earnings which they have to put back into property to take care of the constantly growing business.

The Peking-Mukden Railway in five years has had an increase of 50 per cent in traffic with an increase of equipment of about 20 per cent. The other roads have had larger increases with less increase of equipment. Today China is an excellent place in my opinion for the Americans to introduce the selling of equipment or equipment bonds on what seems to me to be a very gilt-edged security to pay for it in the end; one interesting fact is that up to date China has not defaulted on any of her railway obligations.

New Lines Needed

The building of new lines in China is one of the things which deserves a great deal of consideration. The one line which they need immensely is the line from Canton to Hankau, making connections across that part of China and I feel warranted in making the statement that they will never get the Chinese currency straightened out until they get transportation facilities in China for the reason that you cannot have exchange without transportation facilities. You cannot have stability of exchange; therefore they will continue to have their local currencies in China until they get transportation.

I went to China with the idea that I would not undertake to study the loan situation. I found if I was going to make any intelligent report whatever on the railway markets of China, I would have to study loans. I found it a very interesting subject, one of the most interesting subjects I have ever taken up, and in doing that I feel a great deal of sympathy for the Chinese notwithstanding a great many of their shortcomings.

Chinese Have Been Imposed Upon

The Chinese today have been imposed on. The Chinese situation, as a whole, has not been allowed to develop on account of limitations, restrictions of a great many of these loan agreements which are utterly selfish from the standpoint of the people who own them, and I believe that one of the greatest things that could happen to China is to have her railways taken in hand, untangled, straightened; it will be to the good not only of China as a whole but to the good of the actual owners of the loan securities.

The Chinese at the same time no doubt should take steps to remove some of their leaks and obstructions and other difficulties of that kind. The Chinese would probably have to admit and agree to a general supervising situation. I think, however, that they would readily do that. In fact, I was told they would, and by very good authority—in one instance by the vice-president of the Ministry of Communications Committee. He said they would be very glad to exchange twelve different piecemeal controls for one comprehensive control.

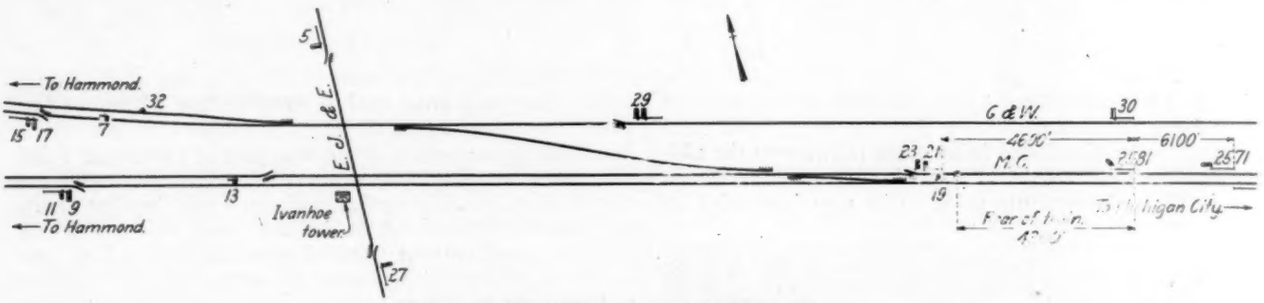
The railways of China today have an equity in their balance sheets and this is not fictitious value but is a real assessment, of about $450,000,000 Mex. Of this the Chinese Government controls (in round figures) an equity of about $1,500,000, Mex. In other words, today they do own actually about one-third of their own railways. Therefore, I think that one of the conditions of peace should be the straightening out of some of the Chinese situations, particularly the results of the battle of concessions, and the battle of concessions in my opinion laid some of the foundation stones for the war. And if they are not corrected, they will be a contributing element to another war!

Rear End Collision at Ivanhoe, Ind., on Michigan Central

AT 3:57 A. M., SATURDAY, June 22, an empty westbound equipment train on the Michigan Central, consisting of 20 tourist sleepers and 1 coach, crashed into the rear of the second section of a circus train, at Ivanhoe interlocking plant, near Hammond, Ind., killing 78 and injuring 120 persons on the circus train, according to the latest available information. Trainmaster F. S. Whipple, who accompanied the second section of the circus train, was evidently killed in the accident as no trace of him has been found. Many of the bodies recovered were charred beyond recognition and it is doubtful if the total number of killed and missing will ever be determined.

After a performance at Michigan City, Ind., the Hagenbeck-Wallace circus was being moved in two sections to Hammond, Ind. These trains were being run over the Michigan Central to Ivanhoe, at which point they were diverted over the Gary & Western into Hammond. The interlocking plant at which the accident occurred is approximately five miles west of Gary and four and a half miles east of Hammond. The second section of the circus train consisting of 27 cars, passed the Michigan City depot at 1:00 a. m., pulling up to Tenth Street, where the loading was completed. This train left there at about 2:30 a. m., arriving at Porter, 11.8 miles distant, at 3:06 a. m.; at East Gary, 9.2 miles from Porter at 3:30 a. m.; at Tolleston, 6½ miles from East Gary at 3:44 a. m. and at Ivanhoe approximately 3.3 miles from Tolleston at 3:55 a. m. The train sheets show that the empty equipment train, pulled by engine 8485 and in charge of Engineman A. Sargent and Conductor L. Johnson passed the Michigan City depot at 2:55 a. m; Porter at 3:20 a. m.; East Gary, at 3:34 a. m., and Tolleston at 3:52 a. m.; and crashed into the rear end of the second section of the circus train at 3:57 a. m.

This portion of the Michigan Central is a double track line completely equipped with automatic block signals. The track is on tangent for over a mile east of the point where the wreck occurred. At the point of the accident the Gary & Western tracks are parallel to and 85 ft. north of those of the Michigan Central. The night was clear with nothing to obstruct the view, the accident occurring in the country with no manufacturing plants or factories nearby. The westbound home signal for Ivanhoe interlocking plant is located 950 ft. east of a crossing of the Elgin, Joliet & Eastern and 270 ft. east of the crossover switch leading to the Gary & Western tracks.



The Track Layout of the Ivanhoe Accident

The second section of the circus train traveled from Porter to East Gary, a distance of 9.2 miles, in 24 minutes, running at an average speed of 23.4 miles an hour. The empty equipment train traveled this distance in 14 minutes, running at an average speed of 39.1 miles an hour. The circus train covered the distance between East Gary and Tolleston, 6.5 miles, in 14 minutes, an average rate of 27.9 miles an hour, while the empty equipment train covered the same distance in 18 minutes at an average rate of 21.7 miles an hour. The distance between Tolleston and Ivanhoe, approximately 3.3 miles, was covered by the circus train in 11 minutes, running at an average speed of 18 miles an hour, while the empty equipment train covered it in 5 minutes, running at an average speed of 39.1 miles an hour. The empty equipment train passed East Gary 4 minutes after the circus

A General View of the Ivanhoe Accident Showing the Debris, the Gary & Western at the Right and the Howe Signal in the Distance

train, while at Tolleston the interval between the two trains was 8 minutes. From this it appears the empty equipment train slowed up materially between East Gary and Tolleston, or while passing through the city of Gary, but resumed an average speed of 39 miles an hour at or near Tolleston.

The second section of the circus train consisted of stock cars, flat cars and four sleeping cars, which were just ahead of the caboose. These sleeping cars were converted wooden equipment. The engine plowed through the sleeping cars

A Close View of the Burning Debris

and after the crash these four cars and one flat car were destroyed by fire, which evidently started from the gas lighting system with which the sleeping cars were equipped. That the casualties were so large was due to the sleeping cars being of wooden construction and that they were equipped with three tiers of double deck bunks instead of two as in ordinary sleeping cars.

The second section of the circus train had a blazing journal box on one of the cars and stopped, after having started to cross over to the Gary & Western tracks with the rear of the train at a point approximately 300 ft. in advance or east of the home signal of the Ivanhoe interlocking plant on the westbound main track of the Michigan Central and 4,300 ft. beyond or west of the distant signal. An automatic block signal was located 6,100 ft. east of the distant signal. When the second section of the circus train stopped to cool the hot box the flagman started back with fuses and lantern. It appears from the preliminary investigation that the automatic signals and the signals of the flagman were disregarded by the engineman of the empty equipment train, as, after the accident, the distant signal for the interlocking plant was found to be in the stop position with the red light showing, while the automatic block signal was found to be in the caution position with the yellow light showing properly. This shows that the signals were operated properly. The signal system consists of one arm, three position upper quadrant signals.

After receiving the caution indication the engineman should have been prepared to stop at the next signal in advance. Rule 8 of the automatic block signal rules, in the Book of Rules for the operating department of the Michigan Central reads, "a train passing an automatic distant signal which indicates caution must be under control so it may be stopped on reaching the home signal." All employees involved in this accident, and in fact all employees in the entire transportation service are examined on all block signal and operating rules once a year as required by the State of Indiana.

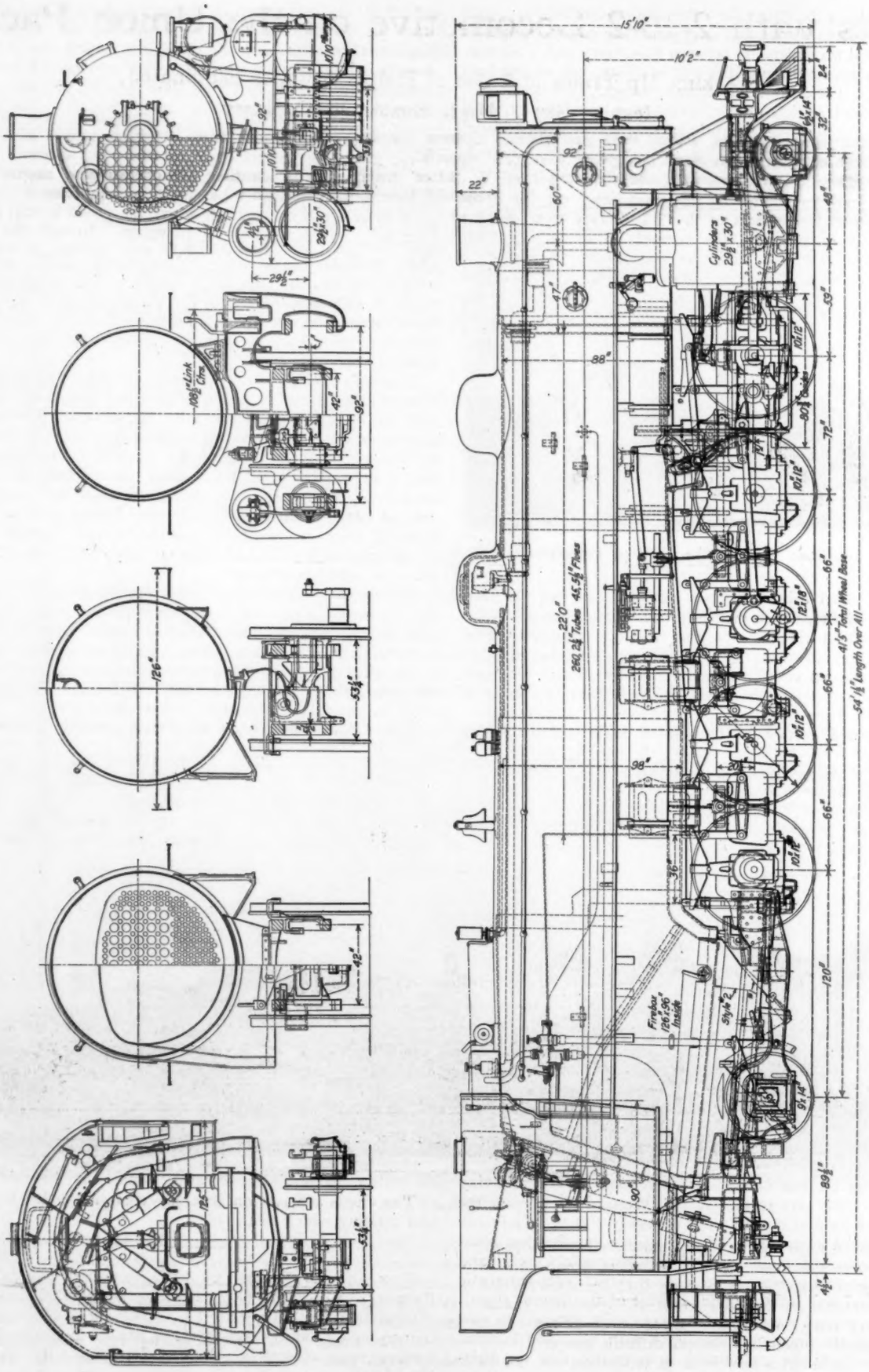
Engineman Sargent has been in the service of the Michigan Central from 25 to 28 years, is an extra passenger engineman and is about 55 years old. He reported for duty at 9:30 p. m. on June 21, having been off duty since 1:30 p. m. on June 20. At the time of the accident he had been on duty 6 hr. and 27 min. with a total time off duty of 32 hr. prior to starting work. Mr. Kraus, fireman was called for duty at 12:15 a. m. on June 22; after having been off duty from 12:25 a. m. on June 21, or 23 hr. and 50 min. prior to starting work. He had been on duty 3 hr. and 42 min. when the collision occurred.

Further investigation indicates that Engineman Sargent was dozing or asleep, which was responsible for the accident. The flagman of the circus train was back from 600 to 800 ft. at the time of the accident. At the coroner's inquest at Hammond Tuesday, Engineman Sargent under his constitutional rights refused to testify at this time. Conductor Johnson stated to Sargent after the wreck: "This is quite a bad mess we got into," and asked him what was the matter. Sargent's answer was: "I must have been dozing."

A View of the Wreck

The circus officials on Tuesday compiled a list of dead and missing which totals 78.

THE UNITED STATES IN 1917 PRODUCED 342,000,000 BARRELS OF CRUDE OIL, against 300,000,000 in 1916, 210,000,000 in 1910, and 64,000,000 in 1900, and this country now produces two-thirds of the oil of the world, according to a compilation by the National City Bank of New York.



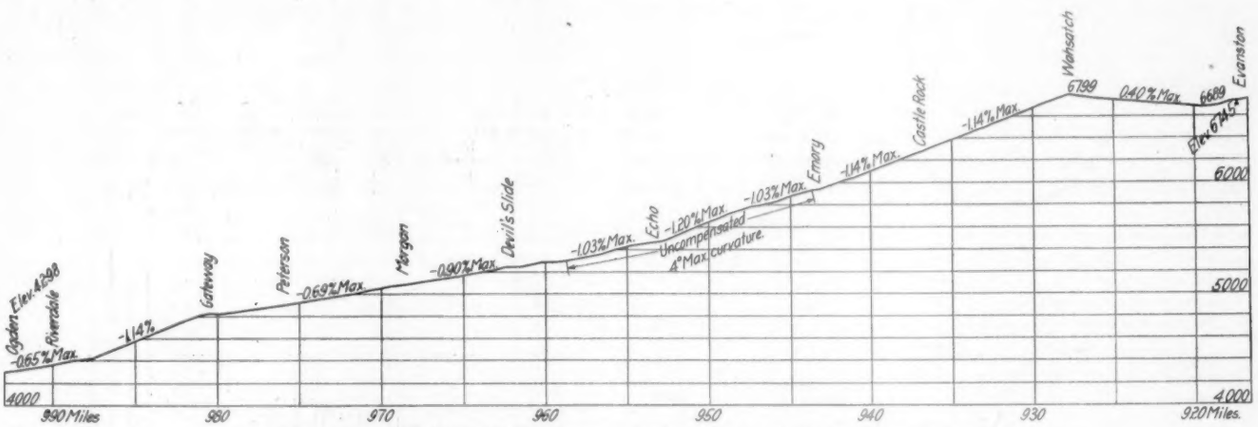
Elevation and Cross Sections of Union Pacific 2-10-2 Type Locomotive

Tests with 2-10-2 Locomotive on the Union Pacific

Breaking Up Trains and Use of Helper Engines Eliminated; Results Show High Sustained Capacity

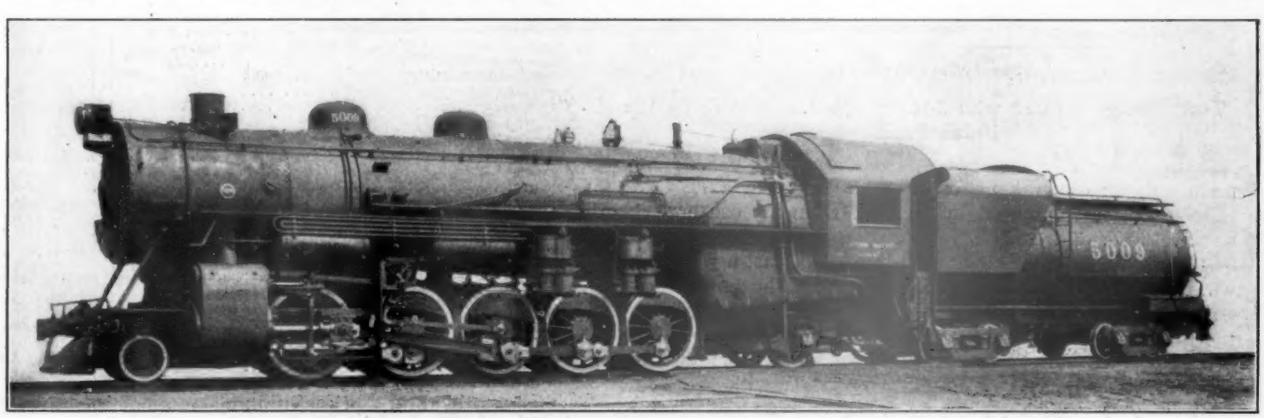
THE UNION PACIFIC SYSTEM has recently reduced the grades on certain parts of the Western Division. With a view to increasing the train load on the reconstructed line, locomotives of the 2-10-2 type were designed for this division under the supervision of C. E. Fuller, superintendent of motive power and machinery and A. H. Fetters, mechanical engineer. Twenty-seven of these engines were built last year by the Baldwin Locomotive Works, fifteen for the Union Pacific, six for the Los Angeles and Salt Lake and six for the Utah Railway. Of these, ten were placed in service on the Union Pacific between Ogden, Utah, and Evanston, Wyo., a division 75.8 miles long. The old line between these points had ruling grades of 93 feet per mile eastbound, while the new line has a ruling grade of 60 feet per mile. East of Evanston for 400 miles the ruling grade is 43 feet per mile. The 2-10-2 type locomotives were designed primarily to move the same tonnage eastbound over the new line with a ruling grade of 1.14 per cent, compensated for curvature, that the Mikado locomotives handle over the lines with .83 per cent grades. A secondary object was the elimination of helper service on this district, which has several difficult grades.

These locomotives have been in service for six months and have given very satisfactory results. A condensed profile of the line on which they are operating is shown below. The reconstruction work has not been completed on this line and there are short sections where the grade is still 63 feet per mile, uncompensated for curvature. In tests the 2-10-2 type locomotives handled 1,800 tons eastbound over this division at an average running speed of 15 m. p. h. The average coal consumption was 358.4 lb. per thousand gross ton miles. The curves reproduced herewith show the tractive effort and drawbar pull developed and also the horse power. A maximum of 2,940 horsepower was developed at a speed of 30 m. p. h. This is at the rate of one horsepower for every 121.6 lb. weight of the locomotive in working order, which is unusually good performance.



Profile of the Union Pacific Between Ogden, Utah, and Evanston, Wyoming

The Union Pacific 2-10-2 type locomotives have a rated tractive effort of 70,450 lb. with 285,500 lb. on the driving-wheels, the ratio of adhesion being 4.05. The total equivalent heating surface is 7,045 sq. ft. or one sq. ft. for each 10 lb. of tractive effort. This ratio indicates ample steaming capacity for the heavy class of freight service in which these engines are used.

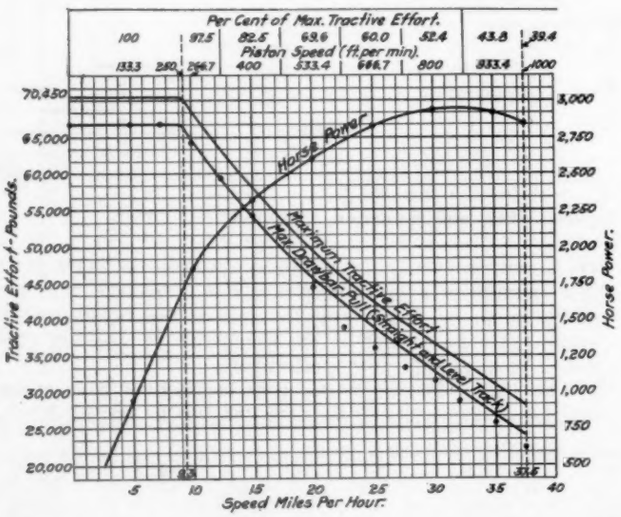


Heavy Freight Locomotive for the Union Pacific Which Develops 2950 Horsepower

The boiler is of the straight-top type with a wide, deep firebox placed back of the drivers and over the rear truck.

A combustion chamber four feet long extends forward into the boiler barrel, and the tubes have a length of 22 ft. The middle barrel ring has a slope on the bottom to provide a sufficiently deep water space under the combustion chamber. All seams in the firebox and combustion chamber are welded, with the exception of that uniting the back sheet with the crown sheet and side sheets. The seam around the firedoor opening is also welded. Flexible stay-bolts are used in the breaking zone and in the six front rows of stays over the combustion chamber. At the point where the three upper rows of flexible stays on each side pass through the boiler barrel, bosses are welded to the sheet in order to provide a sufficient number of threads for the staybolt sleeves. Both the coal burning and oil burning locomotives are equipped with Security sectional arches and the coal burners are fired by Street type "C" stokers. The superheater consists of 45 elements and has a superheating surface of 1,262 sq. ft.

The piston valves are 15 in. in diameter and are driven by Walschaert valve gear which is controlled by a Ragonnet power reverse gear having both air and steam connections. The piston heads are steel castings of dished section 7 in. wide with phosphor bronze bearing rings and gun iron packing rings. The piston rods are of open-hearth steel heat treated and hollow-bored. The same material is used for the crank pins and driving and trailing axles which are also hollow-bored. Long driving boxes are applied to the



Test Results Secured with 2-10-2 Type Locomotive on the Union Pacific

main axle and lateral motion boxes to the front axle. The latter are used in connection with the Economy constant resistance leading truck.

The frames are annealed vanadium steel castings 5½ in. wide and spaced 42 in. between centers. They are braced transversely between adjacent driving wheels and also at the third, fourth and fifth pairs of driving pedestals. The driving box wedges are self-adjusting. The Commonwealth rear frame cradle is applied in combination with the Delta trailing truck, which serves the triple purpose of a frame, radius bar and equalizer. The trailing truck is equalized with the two rear pairs of drivers, the equalization being through a central vertical, heart-shaped link which is suspended from a transverse beam hung from the rear driving springs. This link acts not only as the equalizer connection, but also as the rear truck radius bar pin. It is circular in section at its lower end, and is guided in the frame cradle casting. The bearing between the equalizer frame of the truck and the locomotive frame is made with a spherical surface to provide sufficient flexibility.

The driving brake system is divided between the third and fourth pairs of wheels. The rear cylinders are placed in a horizontal position back of the main pair of wheels, while the front cylinders are placed vertically and are bolted to the cylinder saddle casting. The arrangement is such that all shoes bear on the backs of their respective wheels. The tender is carried on forged steel wheels, and is of the Vanderbilt type, with equalized trucks and a one-piece cast steel frame.

The principal dimensions and ratios of the locomotives are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Freight
Fuel	Coal or oil
Tractive effort	70,450 lb.
Weight in working order	357,600 lb.
Weight on drivers	285,500 lb.
Weight on leading truck	23,600 lb.
Weight on trailing truck	48,500 lb.
Weight of engine and tender in working order	554,200 lb.
Wheel base, driving	22 ft. 6 in.
Wheel base, total	41 ft. 5 in.
Wheel base, engine and tender	77 ft. 6 in.

Ratios

Weight on drivers ÷ tractive effort	4.05
Total weight ÷ tractive effort	5.08
Tractive effort × diam. drivers ÷ equivalent heating surface*	6.30
Equivalent heating surface* ÷ grate area	83.9
Firebox heating surface ÷ equivalent heating surface,* per cent	5.37
Weight on drivers ÷ equivalent heating surface*	40.5
Total weight ÷ equivalent heating surface*	50.8
Volume both cylinders	23.73 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	296.9
Grate area ÷ vol. cylinders	3.54

Cylinders

Kind	Simple
Diameter and stroke	29½ in. by 30 in.

Valves

Kind	Piston
Diameter	15 in.

Wheels

Driving, diameter over tires	63 in.
Driving, thickness of tires	3½ in.
Driving journals, main, diameter and length	12 in. by 18 in.
Driving journals, others, diameter and length	10 in. by 12 in.
Engine truck wheels, diameter	30 in.
Engine truck, journals	6½ in. by 14 in.
Trailing truck wheels, diameter	45 in.
Trailing truck, journals	9 in. by 14 in.

Boiler

Style	Straight top
Working pressure	200 lb. per sq. in.
Outside diameter of first ring	88 in.
Firebox, length and width	126 in. by 96 in.
Firebox plates, thickness	Sides, back and crown, ⅜ in.; tube, ½ in.
Firebox, water space	Front, 6 in.; sides and back, 5 in.
Tubes, number and outside diameter	45—5½ in.
Flues, number and outside diameter	260—2¼ in.
Tubes and flues, length	22 ft. 0 in.
Heating surface, tubes and flues	4,774 sq. ft.
Heating surface, firebox, including arch tubes	378 sq. ft.
Heating surface, total	5,152 sq. ft.
Superheater heating surface	1,262 sq. ft.
Equivalent heating surface*	7,045 sq. ft.
Grate area	84 sq. ft.

Tender

Tank	Cylindrical
Frame	Cast steel
Weight	194,600
Wheels, diameter	33 in.
Journals, diameter and length	6 in. by 11 inch.
Water capacity	10,000 gal.
Coal capacity	17 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

ROAD TRANSPORT PROBLEM IN ENGLAND.—By an order in council, new powers are vested in the British Board of Trade for providing and maintaining an efficient system for the transport of freight by road. The Board may regulate, restrict, or give directions respecting the use for the purpose of road transport or the sale or purchase of horses or vehicles engaged on road transport. The Board may also require any horse or vehicle to be placed at their disposal either absolutely or by way of hire. Power is given to prohibit transportation of freight of any class by road and to prescribe the radius or distance within which freight may be conveyed by road.

New York Central Safety-First Department

A Salaried Specialist on Each Division; Results of Experience in Refinement of Details

THE ESTABLISHMENT of safety committees on all railroads under federal control, as announced in circular No. 5, of the director of the division of transportation, noticed in the *Railway Age* of June 14, page 1422, puts into effect, throughout the country, a system of instruction and supervision, as related to the duty of railroad employees to look out for the bodily safety of themselves and their fellow workers, which has already accomplished remarkable results on a considerable number of important railroads, and which is sure to be of great benefit on any road wherever it is carried out with vigor and persistency. The term "safety-first," as introduced into the railroad world by R. C. Richards, in 1910, means two things: (1) the simple operation of *reversing* the habits of mind of those men who, from excessive engrossment in their work, make care for their own safety secondary and (2) the correction of the mental attitude of those others who neglect their own safety, not because they are too earnest in their work, but because they lack the instinct, or intelligence or training, to put *anything* first; who are unsystematic or lazy or thoughtless in various directions.

This process of correction, though simple, is not easy; the task is a never-ending one; and committees are necessary, on every railroad division, to attend to the rather humdrum business of keeping the men keyed up to the importance of remembering one of the fundamental conditions of their vocation—that of keeping themselves fit to perform their duties. The universal principle that what is everybody's business is nobody's business is in evidence every day of the year; and only a thoroughly efficient organization can avert the well-known weakening effects that are observable in any enterprise in which the principle is forgotten.

Mr. Gray's circular, before referred to, follows closely the lines laid down by the American Railway Association in 1913 (Circular No. 1333), under nine heads. The plan was outlined in the *Railway Age* of April 21, page 1461.

To put the character of this plan before the reader in concrete form we give below a sketch of the operation of the system on the New York Central Lines, under the direction of Marcus A. Dow, general safety agent, who has built up a thorough and efficient organization throughout the twenty or more divisions of the roads under New York Central control. He has an assistant general safety agent in his office at New York city, and one on each important division of the road, sixteen of these in all (some of them attending to one large and one small division). These division agents devote their whole time to this work. For a good part of the year—except in the summer—they have the benefit of one or other of the two motion pictures which have been devised by Mr. Dow for use as aids in impressing their lectures on the employees. Two cars, with attendants, are devoted to these pictures and the safety agents give lectures to the employees, 50 to 75 at a time, in these cars, as they are moved about.

The keynote of the New York Central safety-first system is the maintenance of regular committee meetings on every division, with constant correction of any inattention or negligence of the committee members. Many of the innumerable small duties that appeal to the safety-first committee-man are so elusive that many men—strong-minded men as well as those not so strong—fail to do their best *except as they are held to very definite regulations;* and the prevention of the general lapse into carelessness, which would naturally follow this condition, constitutes about the whole function of the safety-first department.

The report of the meeting of the Safety Committee of the Syracuse division of the New York Central, on November 5, last, affords a typical illustration of the amount and kind of work done at such a meeting. This report fills 18 large pages, and the transcript of it which is given below is substantially verbatim down as far as the headings of the columns. From that point, onward, we have selected sample paragraphs illustrating the kind of subjects coming from different departments, limitations of space forbidding the reproduction of the whole report, which includes 166 items having to do with faults in physical features (ending on the 16th page) and 44 paragraphs having to do with the correction of improper practices. In this particular report no items whatever have found a place in the last column ("Referred to general committee") and only one item, No. 1083, is found in the column headed "No Action." The extent to which these meetings go into particulars will be understood when it is noted that Mr. Leonard, general yardmaster, who reported item No. 1091, reported also 46 others. (But in this case there had been no meeting for three months.) Mr. Schaff, the safety agent of the division (devoting his whole time to this work) made 14 suggestions, all but one of which were referred to some department for attention. That is to say, his observations came before this meeting as new business, whereas most of the items reported by other members had to do with matters which had already received some attention, and in many cases had been finally settled. The instructions given by the general safety committee to the division committees call upon members to report, to the proper officer, every unsafe condition or practice as soon as discovered; and if such reports are made, and are properly acted upon, the committee member can, of course, report both the discovery and the correction at the same meeting.

A subject which is continued from one meeting to another appears, by number, in the records of each successive meeting until it is finally disposed of. A report of each division meeting must be sent to the general safety agent at New York city, within ten days after adjournment. Where a committee decides to take no action, it is required to give the reasons for such decision (which requirement, however, appears to have been disregarded in this particular case). If a matter is referred to the general committee the chairman of the division committee must give full information, including, where appropriate, plans for improvements of structures, and estimates of costs; and the division committee is required to make a definite recommendation.

Sample Report of Divisional Meeting.

SYRACUSE DIVISION: DATE OF MEETING, NOVEMBER 5, 1917: HOUR OF ASSEMBLING, 1 P. M.; HOUR OF ADJOURNMENT, 5.30 P. M.

MEMBERS OF COMMITTEE.

(Enter names of all members and indicate those absent, if any, by *.)

Name	Occupation	Name	Occupation
F. W. Everett, Chairman	Superintendent	C. F. Ray	Trainmaster
E. Lambert, Secretary	Trainmaster	F. H. Eaton	Conductor
*B. M. McDonald	Division Engineer	*C. C. Gleiner	Dist. Claim Agt.
*E. L. Gilbert	Supervising Agent	W. S. Clark	Asst. Dist. M.C.B.
W. L. Crandall	Master Mechanic	H. G. Farnham	Chief Signalman
J. E. Sullivan	Fireman	C. D. Schaff	Safety Agent
T. Leonard	Gen. Yardmaster		
G. J. Klumpp	Supervisor Bridges		
J. Parker	Supervisor Signals		
J. T. Howley	Gen. Yardmaster		
A. M. Clough	Supervisor Track		
E. Alexander	Engineman		

*B. M. McDonald—Pressure of other business

*E. L. Gilbert—Pressure of other business.

*Mr. C. M. Robson—represented by Mr. Gleiner.

The attached report (on sheets 1 to 18 inclusive) is a correct account of the proceedings of the committee at its meeting above mentioned.

F. W. EVERETT, Chairman.

Item No.	Item, Name of Member reporting, and his recommendations.	Action taken	Give item numbers in these columns: Corrected	For further consideration	No action	Referred to General Committee
826	Switchstand in station platform at Akron between main tracks into which passengers might walk after alighting from trains after dark	Held for further investigation		826		
1064	Mr. J. Parker submitted report from C. A. Kaeli, suggesting that railing along track 4, east end river bridge, be extended farther east and along platform to the old Carpenter Shop, Rochester	Railing has been extended	1064			
1072	Mr. C. C. Gleiner suggested fence across the end of the sidewalk, south side of tracks, west side of West street, Syracuse	Matter now up with DL&WRR as fence would be on their property		1072		
1076	Mr. T. Leonard submitted report from Asst. Yd. Master R. F. Smith, that a large number of old rails were lying between 12 and 13 of the Westbound Advance Yard	Account of shortage of track laborers, only part of the rails have been picked up. Will be taken care of soon		1076		
1082	Mr. C. E. Olp suggested car replacer racks be provided in Batavia yard so that the replacers would be out of the way	Racks have been provided	1082			
1083	Mr. C. E. Olp suggested guard be provided around a dwarf signal near station platform at Batavia to prevent passengers from running into same.	Not necessary				1083
1090	Mr. E. Lambert, October 28th, found board with upturned nails at east end of Belle Isle Yard	Nails were bent over so points were even with board	1090			
1091	Mr. T. Leonard submitted report from Yardmaster C. T. Farrell, who on Aug. 10th observed upper deck door of car 60390 to be swinging	Inspectors put door back in place	1091			
1095	Mr. T. Leonard submitted report from Yardmaster C. T. Farrell, who on Sept. 15th observed trespasser in a drunken condition attempting to board a westbound freight train, DeWitt Yard	Sent him from yard	1095			
1104	Mr. T. Leonard submitted report from Yard Conductor S. R. Widrick, who on Aug. 27th found broken rail, track 5, Westbound fast freight yard	Repaired by sectionmen	1104			
1111	Mr. T. Leonard submitted report from Yard Brakeman C. Abend who on Aug. 1st discovered drawhead between main track 4 and yard track 1, westbound class yard, DeWitt	Removed to place of safety	1111			
1112	Mr. T. Leonard submitted report from Yard Brakeman A. B. Hill who Aug. 3rd discovered bad door which would not clear other cars on adjacent tracks in class yard, DeWitt	Car cut out and repaired	1112			
1152	Mr. J. Parker submitted report from Maintainer S. V. Doran, who reported guy wire from telegraph pole close to highway leading to freight house at Palmyra	Reported to supt. of telegraph for correction and report		1152		
1163	Mr. J. Parker submitted report from Foreman C. W. McCulley, who on Sept. 25th observed two of Judd's expressmen shoving trunks from a truck, one just missing two young ladies, Syracuse Station	Taken up with Judd's Express Co. and their men instructed that trunks should be pulled off and not shoved off	1163			
1174	Mr. J. T. Howley submitted report from Yardmaster Dooley, who on Sept. 15th found brake beam down on NYC 497289, being switched on ladder	Stopped engine and had brake rigging removed	1174			
1187	Mr. J. T. Howley submitted report from Clerk Riley, who on Oct. 9th found large lump of coal lying between tracks 7 and 8 west end of Syracuse Yard	Removed same to switch cabin for fuel	1187			
1202	Mr. C. D. Schaff suggested that a four inch post be erected in the center of the top entrance to subway stairs, middle platform, Syracuse passenger station, to prevent possibility of a baggage truck running down the stairway	Referred to division engineer who advised on Aug. 27th that post had been erected	1202			
1235	Mr. A. M. Clough submitted report from Trainmaster C. E. Olp, that limbs of trees obstructed the view of flagman at the Town Line crossing west of Bergen	Trees have been trimmed	1235			
1236	Mr. A. M. Clough submitted report from Trainmaster C. E. Olp, that the W. P. (factory) have at times barred a car out so that it fouled track 5 to enable them to unload sand into sand house	Requested them to make some other arrangements and never do this	1236			

Mr. Everett reported cautioning Western Union messenger several times about jumping on and off moving trains.

Mr. Lambert reported cautioning Brakeman J. E. Ryan about crossing tracks at west end DeWitt yard, too close ahead of moving cars.

Mr. T. Leonard submitted report from Yard Master P. J. Loughrey, who on Sept. 29 observed Yard Brakeman Rank step in front of a moving car to adjust knuckle, and cautioned him regarding same.

Mr. G. J. Klumpp reports cautioning nine of his men working on the Lewiston branch regarding all unsafe practices in general.

Yard Clerk Lincoln reported cautioning Yard Brakeman C. M. Carlisle about running in front of moving cars in order to open knuckle.

Yard Master Howley reported cautioning two soldiers who were attempting to board a moving train on track 4.

Mr. J. F. Robinson reported cautioning several children about crossing tracks at Station Lyons, on a short cut to school.

Yard Master White at Batavia reports cautioning section foreman whom he observed to run across the tracks without looking to see if there was a train approaching.

Mr. Clough reported cautioning Maintainer T. Doyle at Churchville about running motor cars too close together.

Mr. C. E. Olp reported cautioning passenger on train No. 304 about placing hand under window when attempting to lower same.

Mr. E. Alexander reports cautioning Doper Clyde Fressey about riding on side of cars going into coal trestle at DeWitt.

Mr. C. F. Ray reported cautioning section men who were unloading car coal at DeWitt, carrying it in baskets on their backs across main track 4, where there is a sharp curve with a high bank; instructed them to put a flag out to guard them.

ROLL OF HONOR.

J. H. Mann, operator, Lyons, on November 2 reported fire flying from BD-6, engine 3868, passing that station, and had train stopped at Lyons Junction, where car with broken truck was found.

F. A. Palmer, signalman, SS 18, Palmyra, on July 31 discovered brakes sticking on train 1st 45, passing that station, and stopped train at SS 20, where brakes were released.

This record, it will be seen, embodies only subjects and results. The discussion may take anywhere from an hour to a half day or more and may be recorded in such degree of brevity, or fulness, as may be found desirable.

FOR CONSIDERATION OF THE
CHAIRMAN OF THE DIVISION SAFETY COMMITTEE
AT *Chicago, Illinois.*

Station *Milltown.* Date *May 10, 1918.*

Your attention is called to following practice or condition: *Hole in freight house platform; flooring worn and broken.*

Existing at (Give Exact Location) *No. 1 Inbound house.*

Action taken or Recommendation made. *Recommend repairs be made at once.*

(Signed) *C. C. Miller,* Member Safety Committee

If car or engines reported, always give initial and number.

The current record, from day to day, of the doings of the safety department, between meetings, is embodied mainly in three forms; a card, form ST7, used by committee members to advise the chairman of the division committee of defects or wrong practices which the individual member himself cannot correct; another card, of which a sample (No. 4856) is shown below, to be used by the safety agent in advising of-

ficers of work needing to be done, and, third, a daily report, to be sent to the headquarters at New York, by each of the division safety agents. A sample card of form ST7 shown on opposite page.

The form headed "Safety Work Card" is made in duplicate, the duplicate being sent to the general safety agent at New York; and he, if a response is not in due time received from the superintendent or other officer who has the matter in hand, sends an inquiry to that officer to see what is the cause of the delay.

SAFETY WORK CARD No. 4856

Buffalo, April 30, 1918.

Mr. *S. Emerson, Supt.*

Dear Sir: Have to-day made inspection of *Lead to Pierce Auto Plant, Delaware Ave.* and recommend the following work be done: *Our wires over track are but* 18 *ft.* 5 *in. above rail; should be not less than* 21 *ft. This does not clear man on top of box car. Longer poles should be put in. This should be bulletined until wires are raised.*

C. J. Weber, Safety Agent.

[*Response*]
The above work was completed on *May* 15, 1918, as recommended.
S. Emerson.

This card must be signed by proper officer and forwarded in sealed envelope to the General Safety Agent as soon as work is completed.

The report, given below, signed J. A. Daley, is that of the safety agent of the Middle division of the Michigan Central for May 15. It contains sevent items, three of which are here omitted because of lack of space.

Sample of Safety Agent's Daily Report.

Mr. MARCUS A. DOW,
General Safety Agent. Date May 15, 1918.

INSPECTION.

Place	*Item*	*Reported to*	*Remarks*
Dowagiac	Ex. truck at station not blocked and left dangerously close to main track.	Baggageman	Baggageman left it just for a minute, but said it was not a habit
Lawton	20 ft. iron pipe that serves as flag staff fastened to railing post at freight house by rope twine.	Warehouseman	Arranged to have it wired securely
Kalamazoo	Top step broken and half board missing on freight house steps, east end.	Carpenter foreman by Work Card No. 2741	
"	Interviewed Mr. Shakespear, owner of tree menacing our tracks at Botsford Yd., and secured permission to have same cut down by our men		

Number of employees talked to individually regarding safe practices:

Enginemen	1	Trackmen	3
Firemen	1	Stationmen	2
Conductors	3	Shopmen	
Brakemen	4	Others	3
Switchmen	1	Crossing flagmen	6

How many specific improper practices did you see and take up for correction? 1

How many improper conditions did you see and take up for correction? 5

State whether you attended a meeting of employees—nature of meeting, number of employees in attendance, and what was the nature of your remarks:
I made the trip to-day on way freight, Niles to Kalamazoo, and interviewed the crew en route.

Give any other information as to nature of work performed.
Gave a little safety talk to a party of six or eight trackmen who were starting with motor car from Niles to South Bend, and explained the different kinds of accidents that happen to motor cars, and especially with regard to handling car in approaching street crossings.

J. A. DALEY.

The personal work done by the division safety agents, as indicated by their daily reports, is summarized at the general office each month in a statement showing, for each agent, the number of men in each class who have been spoken to, and the number of specific remedial measures taken. A sample of this report for the month of May is shown in the double column table.

Another interesting monthly statement is that showing what has been done by each of the two motion picture cars, and its location on each day of the month.

That for the month of March is as follows:

LOCATION OF MOTION PICTURE CARS.

LINES EAST			LINES WEST		
Date	Place	Attendance	Date	Place	Attendance
1	Rochester	89	2	Transfer — Nottingham to Collinwood	—
3	Sunday		3	Sunday	
4	Batavia	66	4	Collinwood	334
5	"	135	5	"	261
6	Buffalo Exchange St. Sta	86	6	"	269
7	" " " "	132	7	"	263
8	" " " "	248	8	"	131
10	Sunday		9	Transfer to Cleveland	—
11	East Buffalo	176	10	Sunday	
12	E. Buffalo Car Shops	322	11	Cleveland Shop	314
13	" " " "	282	13	"	353
14	" " " "	163	14	Cleveland Union Pass Sta	202
17	Sunday		15	" " "	344
18	Depew Shops	133	16	Transfer to Ashtabula	—
19	" "	208	17	Sunday	
20	" "	235	18	Ashtabula New Steel Car Shop	108
21	" "	134	19	Ashtabula New Steel Car Shop	216
22	E. Buffalo West Shore Eng. House	284	20	Ashtabula Round House	140
23	E. Buffalo West Shore Eng. House	77	21	" " "	331
24	Sunday		22	" " "	234
25	Buffalo Exchange St. Sta	35	24	Sunday	
26	" " " "	41	25	Ashtabula	160
27	" " " "	73	26	"	126
28	" " " "	77	27	Film taken to Safety Rally, Detroit 3/28	
29	" " " "	31	31	Sunday	
31	Sunday				
	Total	3027		Total	3786

The differences in the number of persons in attendance is due to various conditions, as for example, how many times in one day an audience can be gathered, and also how many employees are within walking distance at a given location. The report for March shows that from the first until the fifth inclusive, the car on the lines east was in charge of C. D. Schaff; from the sixth to the twenty-ninth, in charge of C. J. Weber. The car on the lines west was in charge of C. W. Hammond, from the second to the seventeenth; and of J. P. Tinley from the eighteenth to the twenty-sixth.

The number of employees killed and injured on the New York Central, including employees not on duty, is shown in a statement which is made up every three months on form ST6. This form, for the New York Central Lines East of Buffalo, has columns for 14 divisions, including the Marine division, and six other columns for the shops, the large shops being treated, so far as this department is concerned, as independent of the divisions. This report is too large for reproduction in this place, but the reader will be interested in the classification of causes of personal injuries. Every statistician having to do with accident records has his own ideas as to the character of this classification, and the extent to which it should go into detail; and whether or not this New York Central classification should be recommended for universal use is a question which need not be considered at this time; but the whole list of causes is reproduced because it is the result of several years of experience; it has recently been revised in some particulars. One class, No. 20, eye injuries, includes all accidents of that kind, regardless of cause; but under every other head the descriptive paragraph is intended to touch only the cause of the accident. To the clerks using the report, the alphabetical arrangement is found convenient.

Classification of Causes of Accidents to Employees

1 Assault, fighting, drowned, shot, skylarking.
2 Bursting of water glasses.
3 " " lubricator glasses.
4 Collisions (except hand, motor or push cars).
5 Climbing over, under or between cars or engines.
6 Coupling or uncoupling:
(a) Air, signal or steam hose.
(b) Connecting or disconnecting safety chains.
(c) Lining up drawhead with hand or foot.
(d) Hand caught while lifting chain or opening knuckle.
(e) Use of lever.
(f) Going between moving cars.
7 Caught in frogs, switches, guard rails, etc.
8 Caught in door or window.
9 Derailments of engines, trains or cars, except hand, motor or push cars.
10 Defective or missing grab irons.
11 Defective or missing running boards.
12 Defective or missing ladder rounds.
13 Defective or missing steps.
14 " " " brakes.
15 Electric shock.
16 Explosion of locomotive boilers.
17 " " stationary boilers.
18 " " gas, oil, etc.
19 " " dynamite.

20 Eye injuries.
21 Falling from engines or cars, moving (not due to defects).
22 Falling from engines or cars, standing (not due to defects).
23 Falling from scaffolding.
(a) Due to breakage or giving away.
(b) Due to other causes.
24 Falling from ladders.
(a) Due to ladder slipping.
(b) " " breakage.
(c) " " other causes.
25 Falling over scrap iron, air hose, couplers, and other removable obstructions.
26 Falling over rails, ties, signal wires and other permanent appurtenances.
27 Falling into engine pits, etc.
28 Getting on or off engines or cars moving.
29 Getting on or off engines or cars standing.
30 Gang planks, slipping or giving way.
31 Hand, motor, push cars or velocipedes.
(a) Colliding.
(b) Derailed.
(c) Struck by train or engine.
(d) Other causes.
32 Handling reverse levers.
33 " signal levers.
34 " rakes.
35 " material, traffic, etc.
(a) Baggage.
(b) Freight (except gang plank slipping).
(c) Company supplies.
(d) Rails, ties, or bridge timbers.
36 Load shifting.
37 Machinery.
(a) Defective.
(b) Unguarded.
(c) Failure to use supplied safety devices.
(d) Gloves or clothing catching.
(e) Cleaning, repairing or adjusting while in motion.
(f) Other causes.
38 Parting of trains.
39 Rough handling of trains.
40 Ropes, cables or chains slipping or giving way.
41 Shaker bar slipping off lug.
42 Stepping on nails.
43 Struck by engines or cars.
44 Struck by engines or cars on adjoining track.
45 Struck by permanent side obstruction.
46 Struck by overhead obstruction.
47 Struck by piece of exploded torpedo.
48 Struck by coal falling from engine tanks or cars.
49 Struck by objects thrown from cars, engines, platforms, etc.
50 Struck by tools or other objects falling from shelves, scaffolding, platforms, etc.
51 Squirt hose pulling off, bursting or cock opening.
52 Slipping on apron of engine (except falling off).
53 Slipping on snow or ice on or between tracks.
54 Slipping on snow or ice on cars (except falling off).
55 Slipping on snow or ice at other places.
56 Slipping from other causes.
57 Throwing switches (not struck by engines or cars).
58 Tools, use of:
(a) Struck by tools in hands of other persons.
(b) Self inflicted injury not due to defects.
(c) Defective hand tools.
(d) Use of jacks (not defective).
(e) Defective jacks.
(f) Use of air hammers, drills, etc.
59 Working under or around cars or engines without protection.
60 Working under or around cars or engines with protection.
61 Not otherwise specified.

Besides the classification according to causes, this statement gives the total number of accidents under each of six classes of service, namely: 1, road service; 2, yard service; 3, shopmen; 4, trackmen; 5, station men, including freight handlers; 6, others.

The reader now has some idea of the machinery by which the safety department is run; but (it is scarcely necessary to say) no machine, not even such a human machine as this one, can take the place of an energizing mind; and Mr. Dow does not rest his reputation for efficiency on any organization, howsoever smoothly it may work. "Safety-first" makes its appeal to the individual's conscience and civic pride and to his devotion to humanity, as well as to the ordinary motive of good discipline and efficiency; and cold formalism must be got rid of as completely as possible. To this end the headquarters office is constantly engaged in gathering and putting into proper shape all available lessons of accidents everywhere, for use by the division safety agents in their lectures to gatherings of employees and to individuals. To record and make simple the lessons of accidents or of blunders on one part of the road for the benefit of employees on other parts is a necessary part of the management of any railroad. A sample circular, that issued by Mr. Dow for the month of October last, contains seven paragraphs concerning accidents which have recently happened on the New York Central Lines, a sample paragraph being as follows:

A baggageman was standing in the open doorway of a baggage car of a moving train with his head against the door jamb. The air brake was applied suddenly and the door slammed shut, catching his head and fracturing his skull. This was a very unsafe place for the employee to stand and it should have been apparent to him.

Notes of this kind are already familiar to railroad men and need no further elaboration. A monthly compilation of this kind is valuable in proportion to the measure in which it enables the lecturer to bring his lessons up to the minute, and to give them local color.

These monthly circulars are sent not only to the safety supervisors, but also to the chairmen of committees. These chairmen number 60, the number of committees being larger than the number of railroad divisions because of the existance of separate independent committees for the large shops and also of sub-committees on some of the large divisions.

One of the important elements of interest in the divisional committee meetings is the reading of short essays by individual members of the committee, particularly by those classed as employees as distinguished from officers; employees who have a store of experience, but who have not had much experience in writing or speaking. This arrangement, drawing out the capabilities of these men, often proves peculiarly profitable, not only to the man himself but to the whole committee. To stimulate activity in this direction the general safety agent sends out, each month to the division chairmen, a topic on which the chairman, acquainted with his committeemen, gets one member to write. Thus, after another month the general safety agent has 60 essays, all on the same subject.

PART OF A MONTHLY SUMMARY OF SAFETY AGENTS' DAILY REPORTS (MAY, 1918).

NUMBER OF EMPLOYEES TALKED TO INDIVIDUALLY REGARDING SAFE PRACTICES.

Safety Agents.	Enginemen	Firemen	Conductors	Brakemen	Switchmen	Trackmen	Stationmen	Shopmen	Crossingmen	Others	Total	Specific Improper Practices and Conditions Taken Up for Correction. Practices	Conditions
Cooper	34	34	24	57	114	78	25	34	24	114	538	20	57
Daley	22	29	61	62	75	57	25	32	34	15	412	14	128
Dayton	95	37	73	112	7	13	9	39	30	39	454	11	27
Hammond	49	53	57	77	173	75	22	29	18	6	559	10	35
Tinley	46	39	48	72	36	60	40	..	49	36	426	24	55
Van Gorder	25	15	22	32	98	28	19	40	11	..	290	..	..
Weber	59	51	73	116	14	15	5	26	2	55	416	14	16
Total	545	425	565	861	899	524	330	1,043	236	769	6,197	239	571

MOTION PICTURE CAR ATTENDANCE.

T. R. Campbell	with motion picture car (Lines West) 18 days—	Attendance	2,287
C. D. Shaff	with motion picture car (Lines East) 10 days—	"	1,850
C. J. Weber	with motion picture car (Lines East) 7 days—	"	928
		Total Attendance	5,065

REPORT ON AUSTRALIAN RAILWAYS.—P. A. Anthony, general manager and chief engineer of the Federated Malay States Railways, has been appointed to make a report on the railways of South Australia.—*The Engineer, London.*

THE GREAT WESTERN OF ENGLAND has completed the construction of another ambulance train for use on the continent, and when it was recently put on view to the public at Paddington station, a charge of 1*s.* ($.24) was made, the money being devoted to charitable purposes.

View of the Two Y. M. C. A. Huts.

St. Louis Committee Excels in Entertaining Troops

Car Service Committee With Assistance of Y. M. C. A. and Patriotic Citizens Does Great Work

PROVIDING OVER 182,000 soldiers and sailors with comforts and entertainment in the course of one year constitutes an enviable record which is rendered more remarkable by the fact that these services were performed free of charge by patriotic railroad officers and citizens in co-operation with the Y. M. C. A. The organization which accomplished this is the Soldiers' and Sailors' Welfare Committee of the St. Louis committee of the Car Service Section. This body was created at the first meeting of the St. Louis car service committee in the spring of 1917 and consists of Rubens Humphrey, chairman, who is also executive secretary of the St. Louis Railroad Y. M. C. A., T. K. Knight, S. S. Huffman, P. W. Conley and A. S. Johnson. From the first the committee's great opportunity for service was recognized and very soon an auxiliary committee was formed principally for the purpose of meeting all troop trains passing through the St. Louis gate-way. The members of this sub-committee were drawn from representative bodies of men and women in the city who had been active in patriotic, civic and philanthropic work. By October 1, 1917, fully 100 men and women were giving their time and enthusiastic effort to the work of the auxiliary committee.

What has been, and is being, done by the Soldiers' and Sailors' Welfare Committee includes many activities, all co-ordinated to secure the best results. For example, carefully selected groups of ladies and gentlemen, all of whom are volunteer workers, meet troop trains in the yards and serve the soldiers and sailors with tobacco, candy, fruit, magazines, papers, souvenir post cards and other comforts. Often troops are permitted to leave their trains for several hours or half a day and at such times the Railroad Young Men's Christian Association opens its doors to the men and permits them to use the swimming pool, billiard tables, bowling alleys, reading rooms, library and other available means of entertainment, without cost. Free writing material is provided and oftentimes the stamps for letters. The Y. M. C. A. restaurant is available to the men and, if any happen to be without funds, as is sometimes the case, no charges are made. In addition, free sleeping accommodations are provided for those who may have to stay in the city over night.

One of the first steps taken by the Soldiers' Welfare Committee was the establishment of an information bureau on the second floor of the St. Louis union station, which is operated by a sub-committee composed of 60 ladies, most of whom are the wives of railroad officers. At this bureau telegrams are sent for the men, relatives found, free writing material provided, magazines distributed, the sick taken care of, and such other assistance rendered as is possible. An important part of the work at Union Station is meeting recruits from all the central district states bound for Jefferson Barracks. These "new" men are given free baths, free beds and frequently free meals until they proceed to the barracks. During the month of December and January when the weather was unusually severe, the committee housed, fed and entertained over 1,000 men in relays of 300 without one serious case of illness.

Committee Builds Huts to Accommodate Men

The work of the Soldiers' and Sailors' Welfare Committee had not been under way long before it was found that the accommodations for the men at the railroad Y. M. C. A. building were taxed to such an extent that railroad members were being denied their privileges. Accordingly, a Y. M. C. A. hut was constructed in front of the Railroad Association building. This structure was erected in the middle of December, 1917, in the short space of 24 hours. The hut, shown in the photograph, is of frame construction, 20 ft. by 120 ft., lighted by electricity and heated by steam.

It did not take long, however, to discover that additional facilities were needed and as a consequence a permanent brick structure, 40 ft. by 140 ft., was built. This hut contains an auditorium seating 800, with a stage and all necessary equipment, including dressing rooms, and is used at night for sleeping purposes. Cots and blankets supplied by the government provide accommodations in this hall for at least 300 men. Canteen service for visiting soldiers and sailors is also provided in this building. Entertainments are staged in the auditorium practically every evening. Dramas, comedies, musicals, patriotic and religious addresses, folk dancing and boxing are among the entertainments provided.

In addition to the entertainment provided there, the city as a whole has extended its hospitality to the men. Through the courtesy of the baseball clubs of St. Louis, several hundred soldiers and sailors have been able to attend big league games without charge. Through the kindness of public spirited citizens of St. Louis several hundred boys have had the privilege of seeing the city by automobile. The welfare committee has also looked after the needs of men who have been rejected for army service. Many of these have been sheltered in the hut and in some cases provided with positions.

The welfare committee's record for the month of May, which is not included in the statistics for its first year's work previously alluded to, is noteworthy. During that time its members met 203 trains, served 59,269 men on trains, 23,198 in the huts and 3,921 at the booth in the station, making a total of 86,388 men served; of this number, 2,507 were provided with sleeping accommodations in the huts, 11,832 with baths and 16 with medical aid. Nearly 17,000 were fed in the canteen at the brick hut and 700 additional were fed in the Railroad Y. M. C. A. building. Approximately 11,000 attended social, educational and religious meetings, while 43,328 letters were mailed through the committee, of which 2,767 were provided with postage by the Y. M. C. A. In addition, positions were secured for 15 rejected men.

Freight Operations for March

THE BUREAU OF RAILWAY ECONOMICS has issued the following report showing the comparative freight operations of the railways for the month of March and the three months of the calendar year, compiled for the American Railway Association.

	United States				Eastern District			
			Increase or decrease				Increase or decrease	
Item	1918	1917	Amount	Per cent	1918	1917	Amount	Per cent
Freight train-miles	50,404,505	49,743,449	661,056	1.3	21,693,330	22,428,967	d 735,637	d 3.3
Loaded freight car-miles	1,207,879,174	1,197,533,361	10,345,813	0.9	560,977,023	578,986,319	d 18,009,296	d 3.1
Empty freight car-miles	484,529,156	493,449,342	d 8,920,186	d 1.8	232,955,690	253,973,608	d 21,017,918	d 8.3
Total freight car-miles—loaded and empty	1,692,408,330	1,685,764,244	6,644,086	0.4	793,932,713	832,959,927	d 39,027,214	d 4.7
Freight locomotive-miles	59,039,387	57,854,935	1,184,452	2.0	27,064,626	27,483,379	d 418,753	d 1.5
Revenue ton-miles	31,341,327,931	29,145,578,151	2,195,749,780	7.5	15,702,320,551	15,370,168,873	332,151,678	2.2
Non-revenue ton-miles	2,571,071,157	2,529,041,027	42,030,130	1.7	912,447,394	915,048,486	d 2,601,092	d 0.3
Average number of freight locomotives in service	28,494	28,013	481	1.7	12,989	12,657	332	2.6
Average number of freight locomotives in shop or awaiting shop	4,259	4,162	97	2.3	2,029	1,866	163	8.7
Average number of freight cars in service	2,192,740	2,121,670	71,070	3.3	1,214,079	1,180,099	33,980	2.9
Average number of freight cars in shop or awaiting shop	110,086	115,475	d 5,389	d 4.7	66,266	66,185	81	0.1
Home	68,047	86,984	d 18,937	d 21.8	39,697	48,790	d 9,093	d 18.6
Foreign	42,039	28,491	13,548	47.6	26,569	17,395	9,174	52.7
Tons per train	673	637	36	5.7	766	726	40	5.5
Tons per loaded car	28.1	26.4	1.7	6.4	29.6	28.1	1.5	5.3
Average miles per locomotive per day	66.8	66.6	0.2	0.3	67.2	70.0	d 2.8	d 4.0
Average miles per car per day	24.9	25.6	d 0.7	d 2.7	21.1	22.8	d 1.7	d 7.5
Per cent of empty car-miles	28.6	29.2	d 0.6	d 2.2	29.3	30.5	d 1.2	d 3.8
Per cent of freight locomotives in shop or awaiting shop	14.9	14.8	0.1	0.6	15.6	14.7	0.9	6.0
Per cent of freight cars in shop or awaiting shop	5.0	5.4	d 0.4	d 7.8	5.5	5.6	d 0.1	d 2.7
Revenue ton-miles:								
Per freight locomotive	1,099,927	1,040,430	59,497	5.7	1,208,894	1,214,361	d 5,467	d 0.5
Per freight car	14,293	13,737	556	4.0	12,934	13,024	d 90	d 0.7
Average miles operated—single track	196,896.97	196,810.09	86.88	a	54,729.02	54,996.28	d 267.26	d 0.5

	Southern District				Western District			
			Increase or decrease				Increase or decrease	
Item	1918	1917	Amount	Per cent	1918	1917	Amount	Per cent
Freight train-miles	9,644,341	8,697,012	947,329	10.9	19,066,834	18,617,470	449,364	2.4
Loaded freight car-miles	218,456,080	200,742,508	17,713,572	8.8	428,446,071	417,804,534	10,641,537	2.5
Empty freight car-miles	96,718,411	87,492,458	9,225,953	10.5	154,855,055	151,983,276	2,871,779	1.9
Total freight car-miles—loaded and empty	315,174,491	288,234,966	26,939,525	9.3	583,301,126	569,787,810	13,513,316	2.4
Freight locomotive-miles	10,907,639	9,809,214	1,098,425	11.2	21,067,122	20,562,342	504,780	2.5
Revenue ton-miles	5,773,780,081	5,224,497,639	549,282,442	10.5	9,865,227,299	8,550,911,639	1,314,315,660	15.4
Non-revenue ton-miles	505,210,001	482,279,234	22,930,767	4.8	1,153,413,762	1,131,713,307	21,700,455	1.9
Average number of freight locomotives in service	4,887	4,747	140	2.9	10,618	10,609	9	0.1
Average number of freight locomotives in shop or awaiting shop	538	591	d 53	d 9.0	1,692	1,705	d 13	d 0.8
Average number of freight cars in service	313,601	267,463	46,138	17.3	665,060	674,108	d 9,048	d 1.3
Average number of freight cars in shop or awaiting shop	12,638	12,763	d 125	d 1.0	31,182	36,527	d 5,345	d 14.6
Home	7,767	10,021	d 2,254	d 22.5	20,583	28,173	d 7,590	d 26.9
Foreign	4,871	2,742	2,129	77.6	10,599	8,354	2,245	26.9
Tons per train	651	656	d 0.5	d 0.8	578	520	58	11.2
Tons per loaded car	28.7	28.4	0.3	1.1	25.7	23.2	2.5	10.8
Average miles per locomotive per day	72.0	66.7	5.3	7.9	64.0	62.5	1.5	2.4
Average miles per car per day	32.4	34.8	d 2.4	d 6.9	28.3	27.3	1.0	3.7
Per cent of empty car-miles	30.7	30.4	0.3	1.1	26.5	26.7	d 0.2	d 0.5
Per cent of freight locomotives in shop or awaiting shop	11.0	12.4	d 1.4	d 11.6	15.9	16.0	d 0.1	d 0.8
Per cent of freight cars in shop or awaiting shop	4.0	4.8	d 0.8	d 15.6	4.7	5.4	d 0.7	d 13.5
Revenue ton-miles:								
Per freight locomotive	1,181,457	1,100,589	80,868	7.3	929,104	806,005	123,099	15.3
Per freight car	18,411	16,554	d 1,123	d 5.7	14,834	12,685	2,149	16.9
Average miles operated—single track	33,750.92	33,623.83	127.09	0.4	108,417.03	108,189.98	227.05	0.2

COMBINED THREE MONTHS JANUARY TO MARCH, INCLUSIVE

Item	United States 1918	United States 1917	Increase or decrease Amount	Increase or decrease Per cent	Eastern District 1918	Eastern District 1917	Increase or decrease Amount	Increase or decrease Per cent
Freight train-miles	147,078,241	154,877,526	d 7,799,285	d 5.0	57,753,106	65,125,800	d 7,372,694	d 11.3
Loaded freight car-miles	3,198,631,205	3,567,563,766	d 368,932,561	d 10.3	1,322,836,434	1,600,782,352	d 277,945,918	d 17.4
Empty freight car-miles	1,319,239,898	1,475,276,129	d 156,036,231	d 10.6	593,657,609	712,929,307	d 119,271,698	d 16.7
Total freight car-miles—loaded and empty	4,517,871,103	5,042,839,895	d 524,968,792	d 10.4	1,916,494,043	2,313,711,659	d 397,217,616	d 17.2
Freight locomotive-miles	172,116,765	184,051,329	d 11,934,564	d 6.5	72,212,508	79,872,217	d 7,659,709	d 9.6
Revenue ton-miles	83,354,991,545	85,615,403,319	d 2,260,411,774	d 2.6	38,021,002,285	41,968,589,340	d 3,947,587,055	d 9.4
Non-revenue ton-miles	7,961,381,191	8,103,985,393	d 142,604,202	d 1.8	2,577,497,872	2,556,034,702	21,463,170	0.8
Average number of freight locomotives in service	30,301	29,925	376	1.3	13,079	12,813	266	2.1
Average number of freight locomotives in shop or awaiting shop	4,653	4,460	193	4.3	2,091	1,950	141	7.2
Average number of freight cars in service	2,324,317	2,246,864	77,453	3.4	1,224,307	1,200,280	24,027	2.0
Average number of freight cars in shop or awaiting shop	118,029	124,049	d 6,020	d 4.9	68,115	69,587	d 1,472	d 2.1
Home	78,106	93,787	d 15,681	d 16.7	43,815	51,882	d 8,067	d 15.5
Foreign	39,923	30,262	9,661	31.9	24,300	17,705	6,595	37.2
Tons per train	621	605	16	2.6	703	684	19	2.8
Tons per loaded car	28.5	26.3	2.2	8.4	30.7	27.8	2.9	10.4
Average miles per locomotive per day	63.1	68.3	d 5.2	d 7.6	61.3	69.3	d 8.0	d 11.5
Average miles per car per day	21.6	24.9	d 3.3	d 13.3	17.4	21.4	d 4.0	d 18.7
Per cent of empty car-miles	29.2	29.3	d 0.1	d 0.2	31.0	31.0	....	0.5
Per cent of freight locomotives in shop or awaiting shop	15.4	15.0	0.4	3.0	16.0	15.0	1.0	5.1
Per cent of freight cars in shop or awaiting shop	5.1	5.5	d 0.4	d 8.0	5.6	5.8	d 0.2	d 4.0
Revenue ton-miles:								
Per freight locomotive	2,750,899	2,860,999	d 110,100	d 3.8	2,907,027	3,275,469	d 368,442	d 11.2
Per freight car	35,862	38,104	d 2,242	d 5.9	31,055	34,966	d 3,911	d 11.2
Average miles operated—single track	219,069.52	219,050.57	18.95	a	57,242.25	57,526.02	d 283.77	d 0.5

Item	Southern District 1918	Southern District 1917	Increase or decrease Amount	Increase or decrease Per cent	Western District 1918	Western District 1917	Increase or decrease Amount	Increase or decrease Per cent
Freight train-miles	28,518,040	27,882,734	635,306	2.3	60,807,095	61,868,992	d 1,061,897	d 1.7
Loaded freight car-miles	589,942,293	623,792,506	33,850,213	d 5.4	1,285,852,478	1,342,988,908	d 57,136,430	d 4.3
Empty freight car-miles	274,747,395	271,216,334	3,531,061	1.3	450,834,894	491,130,488	d 40,295,594	d 8.2
Total freight car-miles—loaded and empty	864,689,688	895,008,840	d 30,319,152	d 3.4	1,736,687,372	1,834,119,396	d 97,432,024	d 5.3
Freight locomotive-miles	32,088,261	31,189,319	898,942	2.9	67,815,996	72,989,793	d 5,173,797	d 7.1
Revenue ton-miles	15,739,160,767	15,696,465,452	42,695,315	0.3	29,594,828,493	27,950,348,527	1,644,479,966	5.9
Non-revenue ton-miles	1,502,731,779	1,526,113,120	d 23,381,341	d 1.5	3,881,151,540	4,021,837,571	d 140,686,031	d 3.5
Average number of freight locomotives in service	5,286	5,215	71	1.4	11,936	11,897	39	0.3
Average number of freight locomotives in shop or awaiting shop	653	642	11	1.7	1,909	1,868	41	2.2
Average number of freight cars in service	352,909	296,350	56,559	19.1	747,101	750,234	d 3,133	d 0.4
Average number of freight cars in shop or awaiting shop	14,123	14,072	51	0.4	35,791	40,390	d 4,599	d 11.4
Home	9,383	11,118	d 1,735	d 15.6	24,908	30,787	d 5,879	d 19.1
Foreign	4,740	2,954	1,786	60.5	10,883	9,603	1,280	13.3
Tons per train	605	618	d 13	d 2.1	551	517	34	6.6
Tons per loaded car	29.2	27.6	1.6	5.8	26.0	23.8	2.2	9.2
Average miles per locomotive per day	67.4	66.5	0.9	1.4	63.1	68.2	d 5.1	d 7.5
Average miles per car per day	27.2	33.6	d 6.4	d 19.0	25.8	27.2	d 1.4	d 5.1
Per cent of empty car-miles	31.8	30.3	1.5	4.9	26.0	26.8	d 0.8	d 3.1
Per cent of freight locomotives in shop or awaiting shop	12.4	12.3	0.1	0.3	16.0	15.7	0.3	1.9
Per cent of freight cars in shop or awaiting shop	4.0	4.7	d 0.7	d 15.7	4.8	5.4	d 0.6	d 11.0
Revenue ton-miles:								
Per freight locomotive	2,977,518	3,009,869	d 32,351	d 1.1	2,479,459	2,349,361	130,098	5.5
Per freight car	44,598	52,966	d 8,368	d 15.8	39,613	37,256	2,357	6.3
Average miles operated—single track	39,141.13	38,973.30	167.83	0.4	122,686.14	122,551.25	134.89	0.1

d Decrease. The returns included in the monthly statement represent about 26 per cent of the total operated mileage of the roads of Class I, and about 90 per cent of their total traffic. a Less than one-tenth of one per cent.

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Some Big Fellows for the French 380's at a Munitions Station

Handling Bulk Cement With a Clamshell

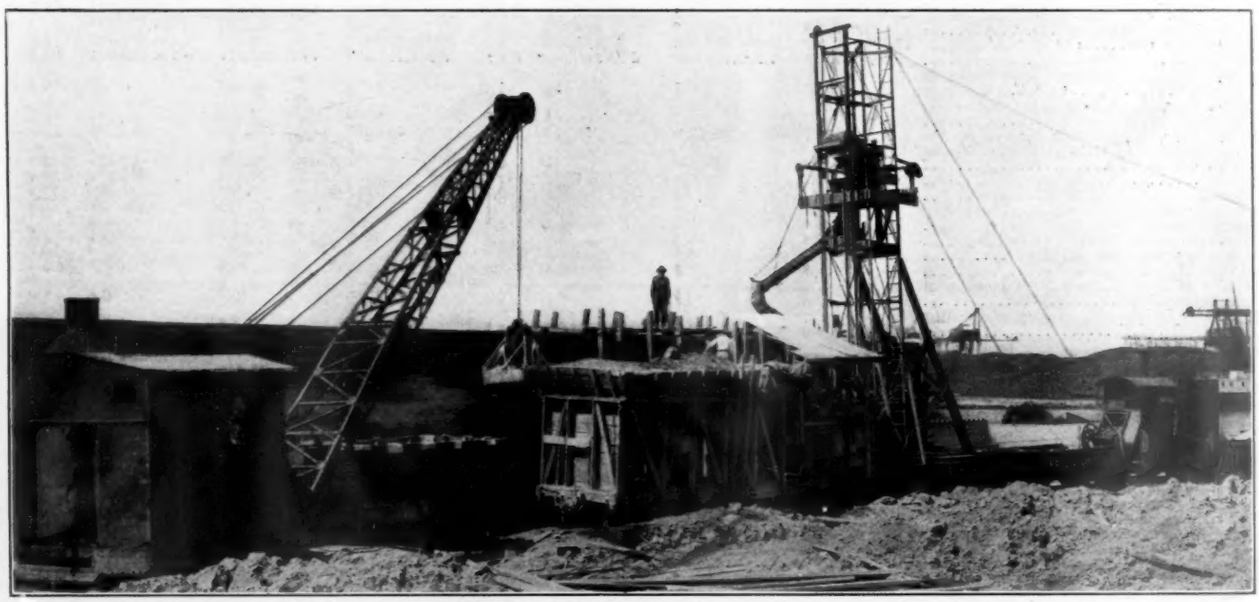
DURING 1917 transportation difficulties caused the cement manufacturers to use gondola cars for the shipment of their product both in bags and in bulk. The lading was protected against the weather by tarpaulins and no appreciable difficulties were experienced by this innovation; in fact, in the case of bulk cement, some material advantages were obtained. Until necessity had demonstrated otherwise, all plans for the use of bulk cement were based on the assumption that the need of adequate protection against rain precluded the use of anything but a closed car. As a result of this the cement of necessity was unloaded either by hand or with a power shovel of the type used for unloading grain at elevators, and when cement was being supplied to concrete mixers mounted on cars as has frequently been the case with concrete work on railroads in cities, it was necessary to suspend the platforms from the sides of the cars so that the cement could be wheeled from the side doors of the cement car to the mixer on an adjacent car.

With a demonstration of the practicability of the use of the open top car in this service, the unloading problem was greatly simplified. If done by hand the gondola car can be equipped with runways like those used on the tops of sand and stone cars, but of greater significance is the possibility of using the clamshell bucket which is so widely used in handling the fine and coarse aggregates for concrete work.

A good example of what has been accomplished along this line is illustrated in the photograph which shows one form of car-mounted mixing plant which was used for the construction of an ore trough at the Illinois Steel Company's Bay View plant at Milwaukee, Wis. The concrete was mixed by a one-yard mixer mounted on a flat car which also supported the bins, hopper and belt which held and carried the raw materials. Above the inclined belt there were separate bins for the sand, stone and cement. The sand and stone dropped on the belt and were conveyed into a measuring hopper immediately alongside the mixer. The cement was shoveled by hand into a measuring box directly above the hopper, and when ready the bottom of the box, which was made of a removable steel plate, was pulled out and the cement followed the sand and stone through the hopper into the mixer.

Just beyond the end of the mixing plant car were cars containing the concrete materials, the cement car being nearest the mixer with the other cars beyond. Materials in these cars were transferred to the hoppers over the concrete mixer by means of a clamshell bucket operated by a locomotive crane which ran on a track alongside that on which the mixer and material cars were standing.

It has been found that the cement car can be cleaned out thoroughly by the man who passes the signals for the dropping of the clamshell into the material cars and as a result there is very little loss of cement. Careful observations have shown that the loss with cement handled in this manner is less than in the case of sack cement. The tarpaulin which is used to cover the cement is rolled back over the temporary frame work which is built on the cars to support it, so that only a portion of the contents of the car is exposed to the weather at one time.



Unloading Bulk Cement With a Clamshell

DUTCH SCRUTINIZE TRAINS.—According to press despatches a semi-official communication has been issued by the Netherlands government in reply to the expression of fear by the British that the control over railroad traffic through the Province of Limberg was inadequate. It says that the trains are submitted to two examinations upon their entry into Holland. The arrangement of the Netherlands government with Germany is that train movements shall not be greater than is customary in peace times.

THE KATANGA RAILWAY, IN BELGIAN CONGO was completed on May 22, thus setting up through communication by rail from Capetown to Bukama on the Congo River, and by rail and navigable waters as far as Boma and the mouth of the Congo. This great work, which may be considered as a section of the line from the Cape to Cairo, has been accomplished under very difficult circumstances owing to the war. The British railway from Buluwayo reached the frontier of the Congo in 1909. Thence it was prolonged under Belgian control, first to Elisabethville (1910), and then to Kambove (1913). Construction, interrupted for a time at the outbreak of the war, was taken up with energy, and has just been brought to a successful ending.

General News Department

D. I. Forsythe, assistant chairman of the Chicago Committee of the Car Service Section, United States Railroad Administration, has been appointed acting chairman to succeed A. M. Schoyer, resigned.

The Palatine, Lake Zurich & Wauconda has filed application with the Illinois State Public Utilities Commission for permission to discontinue operation. The road extends between Palatine, Ill., and Wauconda, 15 miles.

The presidential and diplomatic suite of rooms at the Union Station in Washington, formerly used exclusively for State purposes, has been converted into a canteen station for soldiers, sailors, and marines in transit, and will be in charge of the American Red Cross.

The movement of freight over the main line of the Pennsylvania Railroad now exceeds all former records. At Columbia, Pa., the average daily movement of cars, eastbound and westbound, for the first fifteen days of June, was 8,462. The best previous monthly record was that of May, which was 8,066 cars a day.

The United States Employment Service has established a division of engineering with A. H. Krom, secretary of the American Association of Engineers, Chicago, as director. Opportunity will be given technical men to register for emergency government work or for permanent advancement in positions meeting their qualifications. The office is at 29 South La Salle street, Chicago.

The Federal Employment Bureau at Altoona, Pa., is operated in connection with the employment department of the State of Pennsylvania, and considerable numbers of applications are received. On June 21, seven men were provided with railroad employment. At the same time the Pennsylvania Railroad Company notified the bureau that it would like to hire 2,519 men (or women). Places are waiting on that road in all departments.

The Northwestern Pacific was indicted by a federal grand jury at San Francisco, Cal., on June 18, on a charge of destroying and failing to keep permanent records of its history and operations as required by the Interstate Commerce Commission. The action against the road is the result of the disappearance of papers and documents deemed essential to an accurate valuation of the company's property by the commission.

The Western Regional Purchasing Committee has advised the roads in that area of a considerable amount of new and second hand material available for use by other roads. This material includes 24,400 new and second hand rail braces. a second-hand air compressor, a locomotive type boiler, 61 miles of 60-lb., 70-lb. and 80-lb. A. S. C. E. rail complete with turnouts and fastenings, two 50-ton locomotives, several cars and a large number of through, deck, truss and girder bridge spans.

Maximum prices for anthracite coal at Lake Superior and Lake Michigan docks have been announced by the Fuel Administration. The prices are higher than those of last winter, due to the increased freight rates and the increased cost of handling at the docks. No advantage will result to producers, as the mine prices for coal going to the Great Lakes will be the same as the mine prices for the rest of the tonnage. The order affects only shipments made from the docks on and after June 25.

The train despatchers are not satisfied with the increases in pay awarded them by Mr. McAdoo's general order No. 27, and many communications in their behalf have been received by the Board of Wages and Working Conditions, asking for further consideration and readjustment. A committee of despatchers called on the Board last week, but were put off until later because the Board was still busy with the case of the shop employees in the hope of making a recommendation this week. The despatchers will be given a hearing later.

Prices of iron, as fixed in the agreement made by the price-fixing committee of the War Industries Board with the representatives of the iron ore, pig iron and steel interests have been approved by President Wilson. The maximum prices now prevailing on ore, pig iron and iron and steel products are to be continued in effect for three months ending September 30, but the base prices of Lake Superior iron ore delivered to lower lake ports are increased 45 cents a gross ton, effective July 1, on account of the increase in freight rates.

At Cumberland, Md., one day last week, 21 lawyers "performed a great service for local business men" by unloading a lot of freight at the freight house of the Baltimore & Ohio, relieving a troublesome congestion which had been caused by the impossibility of securing help. Cumberland has enterprising reporters as well as enterprising lawyers, this incident having made for one of them about a column of copy, which was well spiced with names and personal allusions. The lawyers unloaded a carload of tar, a car of mixed merchandise and other things, and received each 24 cents an hour.

Purchase of the Virginian Railway, by the government, is proposed in a bill introduced in Congress on July 21 by Senator James Hamilton Lewis of Illinois. The Virginian runs from the coal fields of West Virginia to tidewater at Norfolk, and the Senator's proposal includes 125,000 acres of West Virginia coal land. The total proposed expenditure is $115,000,000. Mr. Lewis bases his proposal upon the necessity of insuring an adequate supply of coal for the navy; and he says also that such a purchase would afford the means to make a test, on a small scale, of government railroad ownership.

H. A. Garfield, United States Fuel Administrator, has issued a statement saying that misapprehension has arisen in certain quarters as to the meaning of the words "government price," as used in the announcement of the recent increase in the price of railroad coal. It is stated that the government prices for coal are maximum prices, and that it follows as a matter of course that any consumer, including the railroads, may buy for less, provided it is mutually agreeable, but that the preferential car supply has been discontinued and will not be a consideration of the contracts or understanding.

The Chicago sub-committee of the Eastern Regional District has been dissolved and in its place an operating committee for eastern lines has been created at Chicago, with George H. Ingalls, traffic manager of the New York Central Lines, as chairman. Mr. Ingalls has appointed a sub-committee to assist him, consisting of S. K. Blair, general agent of the New York, Chicago & St. Louis, chairman; D. I. Forsythe, secretary; F. C. Batchelder, president of the Baltimore & Ohio Chicago Terminal; W. F. Schaff, general superintendent of the New York Central Lines; W. B. Gibbs, superintendent of the Michigan Central; H. E. Whittenberger, general manager of the Grand Trunk, and W. H. Scriven, general agent and superintendent of the Pennsylvania.

Examiners of Accounts (Male), for service under the Interstate Commerce Commission, are called for by the United States Civil Service Commission. There are vacancies in the Bureau of Valuation and in the Bureau of Carriers' Accounts. Two general grades of eligibles will be established from this examination, the salaries in the first grade ranging from $2,200 to $3,000, and in the second grade from $1,800 to $2,100. Appointments to these positions will be principally

for duty in the field, but some appointments may be made for duty in Washington. It is desired to secure eligibles of large experience, and a register of eligibles will be established for each of the following branches of accounting: (1) Steam railroads. (a) General accounts. (b) Disbursement accounts. (c) Construction accounts in engineering department. (d) Accounting and statistical work in valuation departments. (e) Freight accounts. (2) Electric railroads. (3) Steamship service. (4) Other common-carrier service (including pipe-line, sleeping-car, and telephone and telegraph service.) (5) Public accounting practice (as a certified public accountant or in the office of a certified public accountant.) Applicants should indicate the grade for which they desire to be examined; and they must not have reached their forty-eighth birthday.

The sundry civil appropriation bill was passed by the Senate on June 24. It carries an appropriation of $3,500,000 for continuing the valuation work of the Interstate Commerce Commission and one of $5,250,000 for the Alaska Railroad. The bill had been passed by the House. The Senate added an amendment making the unexpended balance of the appropriation of $20,000 for the Joint Committee on Interstate Commerce (the Newlands Committee), available until expended. The committee discontinued its work when the government took over the railroads, but has the balance of the year in which to submit a report. Another amendment increased the appropriation for the safety appliance and accident work of the Interstate Commerce Commission from $250,000 to $313,000.

Accident Record—Correction

In the derailment of the "Dixie Flyer" on the Nashville, Chattanooga & St. Louis at Vinings, Ga., April 18, the fireman was injured, slightly; he was not fatally scalded, as was stated in our report printed on June 14.

Bureau of Railway Economics to Be Continued

The Bureau of Railway Economics, whose expenses, under an order of the Railroad Administration, may not be charged to the operating accounts of the railroads after June 30. is to be maintained by the railroad corporations, at least until the end of the calendar year. This was recently decided by the executive committee after a great majority of the roads subscribing to the bureau had agreed to continue their regular contributions. The extensive railway library of the bureau has been taken over by the Railroad Administration, but, for the present at least, is to be retained at the offices of the bureau.

Railroads have been authorized by the Railroad Administration to continue to contribute to the maintenance of the American Museum of Safety, New York City.

The Supreme Court's Respect for State Courts

A verdict awarding $25,000 damages to a boy of seven years, whose foot was cut off by a freight car moving on a side track, was one of the scraps of court news published in the New York papers about a year ago. The sum awarded looked very large, especially as it seemed plain, from the facts as published, that the accident (on the Erie Railroad in New Jersey) was due to the child's own fault. He was playing marbles and put his foot across the rail under the car in an endeavor to recover a lost marble. The United States Circuit Court of Appeals sustained the verdict, holding that the New Jersey law, making any person in such a case guilty of contributory negligence, should not apply to infants, though a New Jersey State court had said that it should. The Supreme Court of the United States on May 20, last, in a decision delivered by Justice Holmes, disapproved this view and reversed the judgment. Apparently it remains true, still, in New Jersey, that but for the specific statutory prohibition, a railroad could be mulcted in $25,000 for allowing such an accident to happen on its premises! There was some argument on the claim that the plaintiff had been invited on the tracks, but Justice Holmes says that it is not a question of the susceptibility of the boy to the temptation to play on or around the cars; rather he was impelled simply by the wish to recover his marble. Two justices of the United States Supreme Court dissented from the majority view because the New Jersey State Court, whose opinion had been respected, was not the highest court of the state.

Unused Rails at Vancouver

The Canadian government (Department of Railways and Canals) is negotiating with representatives of the Russian government in the United States for the purchase of rails (150 miles) lying on the Vancouver docks. These rails have been rusting there since the collapse of the Russian Empire. Negotiations, however, are slow and unsatisfactory. The Russian government is in such a chaotic condition that the Canadian authorities are never certain with whom they are dealing. The rails are light weight but in view of the present shortage it is felt that it will be possible to utilize them. In addition to the rails, there are said to be no less than 4,000 cars for Russia stored at the Pacific coast. The cars, unfortunately, cannot be used on Canadian lines.

The Train Despatchers' Association

The annual convention of the Train Despatchers' Association of America, scheduled to be held at Grand Rapids, Mich., on June 18, failed of a quorum (25 members), owing chiefly to the inability of members to be spared from their duties. The only member of the executive committee present was the secretary-treasurer-editor, J. F. Mackie. The annual report to the executive committee by the secretary-treasurer announced that the receipts for the year were $2,431, and the expenditures $3,483, leaving a deficit of $1,052, which, added to that of the previous year makes a total deficit of $1,658, which the Association owes wholly to Mr. Mackie. The membership list indicated a total membership of 635, a falling off of 314 from the previous year.

In the absence of a quorum, the meeting organized itself into an adjustment committee and made the following recommendations to the executive committee, which has power to fill all vacancies and holds over until its successors have been duly elected and qualified: The election of E. W. Weston, chief despatcher of the Northern Pacific at Livingston, Mont., as president, in place of F. N. McPhee, resigned; the election of J. P. Finan, despatcher of the Atchison, Topeka & Santa Fe, Needles, Cal., as secretary-treasurer and editor, to succeed J. F. Mackie, resigned, and the election of F. I. Felter, chief despatcher of the New York Central lines, electric division, Grand Central terminal, New York City, as member of the executive committee in place of C. C. Barnard, resigned; the continuance of the publication of the Train Despatchers' Bulletin reduced in size; the inauguration of a vigorous campaign for members among train despatchers in sympathy with the present principles of the Association, under which train despatchers are regarded as division staff officers bound to render supreme loyalty to the service and not to any protective organization. The meeting pledged loyalty to these principles and active support of them. There was no meeting of the train rules committee during the year, and consequently no report.

J. P. Finan, F. I. Felter and F. H. Hadley expressed their willingness to wait unofficially upon the Director-General in order to protest against the apparent discrimination against unorganized employees, more particularly train despatchers, in the latest award of the wage adjustment commission, which gives train service employees percentage increases based on present pay instead of that of December, 1915. Accordingly, a conference with C. A. Prouty, director of the division of public service and accounts, was arranged for June 22.

Railway Financial Officers

L. W. Cox, secretary of the Society of Railway Financial Officers, announces that the executive committee has decided that the holding of the annual meeting for this year shall be deferred until further action; and that the monthly bulletin of the society be discontinued for the present. Bulletins may be issued from time to time, with the approval of the executive committee.

The rendering of bills for dues will also be deferred until further notice.

Report on Schodack Derailment

The derailment of passenger train No. 29 on the New York Central near Schodack Landing, N. Y., 12 miles south of Albany, on the night of May 13, has been made the subject of a report to the New York State Public Service Commission (second district) by C. R. Vanneman, chief of the Division of Steam Railroads of that commission. The derailment occurred about 11 p. m., and the engineman, the fireman, and two passengers were killed or fatally injured and 87 passengers, 9 mail clerks, and two employees were injured. The derailment was due to excessive speed through a No. 10 crossover and the engineman, who was fatally injured but who was conscious for an hour or more, told a signal maintainer that he, the engineman, was to blame. No other person was nearby when this confession was made and the inspector cannot learn that it was made to any other person. The inspector says that he has no reason to doubt the maintainer's testimony.

The crossover where the derailment occurred leads from the main track to a middle siding, and about an hour before this accident the signalman had found, after admitting a train to the middle siding, that the switch could not be reset to the main track because, apparently, of some obstruction between the switch point and the stock rail. Being unable to set the switch straight and to clear the signal, the next three trains, of which No. 29 was the third, were diverted to the middle siding. The first two of these trains heeded the caution and stop signals properly and went through at slow speed, but No. 29 was not slackened and ran off the track. The distant signal, calling for controlled speed approaching the switch, is about 5,000 ft. in the rear. The signal apparatus was found in good condition and there is no indication that anything had been wrong with it. The derailed engine fell over on its left side and slid along for about 600 ft. tearing up the middle track completely; and the cylinder of the engine plowed a channel so completely that the side rods and valve gear on that side of the engine were not in the least injured. The steam pipe to the left injector was ruptured and the engineman and fireman were badly scalded. The fireman is believed to have perished instantly.

The inspector believes that the impossibility of locking the switch which led to the accident was probably caused by some small foreign object getting in between the switch rail and the main rail, which obstruction was subsequently shaken out when the following train passed over. He finds that the engineman, who was 64 years old and had been a passenger runner for 27 years, was steady, reliable and competent, and men who talked with him before the beginning of this trip, about three hours before, say that he was in absolutely normal condition. The cars were so badly wrecked on their undersides that the brake rigging could not be examined to any profit; but there was no evidence that it had not been in good working condition.

The speed limit for all trains diverted through crossovers, even those which are longer than No. 10, is ten miles an hour; and the current timetable requires passenger trains, when crossing from one main track to another, to be stopped before the home signal is cleared for the crossover movement. In this instance the signalman did not require this stop, but the inspector says that this infraction of the rule had no real bearing on the accident. His conclusions are summarized as follows:

1. That the defect in the switch was such as may be from time to time expected in the operation of a railroad, and that the mechanism functioned properly to protect just such a contingency.

2. That the action of diverting trains through the middle track was entirely proper and that adequate facilities are provided for protecting such a movement.

3. That the signal and interlocking appliances provided are entirely adequate and that they functioned properly on the approach of train 29 on the night of May 13.

4. That the failure of the signalman to comply with the instructions with reference to holding the home signal in the stop position until the train to be diverted came to a full stop had no material, if any, bearing on the cause of the accident.

5. That the accident was caused by the failure of the engineman of train 29 to obey the signal indications governing the movement of this train.

Traffic News

The steamboat lines on the Hudson river between New York City and Albany have made advances in passenger fares, proportionate to those which have been made by the railroads.

The State Public Utilities Commission of Illinois held a hearing at Chicago on June 25, to consider the application of the railroads of that state for rules and regulations governing reconsignment, diversion and transit privileges, identical with those now governing interstate traffic.

Director General McAdoo has authorized the issuance of joint through freight rates between all points in the Pacific Coast and intermountain territory on the one hand and points in the territory East of the Mississippi and South of the Ohio river on the other at the same figures as the rates effective in the corresponding territory north of the Ohio river. The existing rate adjustment in the territory East of the Mississippi and South of the Ohio to and from the Pacific coast and intermountain territory is made up generally by combination of proportional rates East and West of the Mississippi which make a considerably higher through rate than to the corresponding territory north of the Ohio. The new adjustment will better enable the manufacturers in the Southeastern states to reach the Pacific Coast in competition with their competitors in the territory north of the Ohio river. The Southeastern states and the Pacific Coast territory have been contending for this adjustment for years, but the opposition of individual carriers has prevented any change until now. The traffic involved at present is not large but it is thought the adjustment will greatly increase the exchange of commodities between the sections of country interested.

Traffic on New York Barge Canal

A. H. Smith, regional director of eastern railroads, announces that freight rates by canal between New York and Buffalo will be 20 per cent less than rates between the same points by railroad. The new rate, by rail, between New York and Buffalo (first class), is 60 cents; by canal, 48 cents per 100 lb., with other classes in proportion.

At a meeting held at Albany on June 26, to voice the grievances of boatmen and others, G. A. Tomlinson, manager of the Canal Section, United States Railroad Administration, said:

"Last winter when it was announced that the new barge canal would be open for service on May 15, there was little to indicate that the people of the state were interested in its operation. It had been apparent for a year that the canal would be ready in 1918, but no new ships were built, and on the date of the opening only six vessels were in process of construction, three of them for an ore company engaged in transportation from Lake Champlain to New York harbor. There are about 600 vessels of the old type in the canal and adjacent waters. Of these the Railroad Administration has leased 175. Of the remainder an equal number are engaged in the trade between Lake Champlain and New York. A number are being employed by the Navy Department in New York harbor. One fleet of five steamers and several barges is operating between Utica and Albany. There is another large fleet engaged in the general trade. There are very few idle barges notwithstanding that many of them are unfit for service. The Railroad Administration is not opposed to private or individual operation. It has sublet some of its barges to corporations to assist an independent company to move contract freight and has furnished motive power for navigating barges owned by private individuals. Individual operators should maintain the same rates as the government, but the Administration has not insisted upon this point. As a matter of fact not a single carrying rate of all the independent ships at present in operation on the canal has been disclosed to the Administration, and in no instance has the Administration directed an individual or corporation not to use the canal. It is proposed to establish class rates to western points below the all-rail basis, which will be from ten to three cents per hundred pounds under the all-rail rate. On certain commodities which move in large volume, special low commodity rates will be established. . . ."

Commission and Court News

State Commissions

The Public Service Commission of Massachusetts, in accordance with a recent act of the legislature, has been reorganized, and consists now of three members instead of five as formerly. The new commission, as designated by the governor on June 22, consists of F. J. Macleod, Joseph B. Eastman, and Everett E. Stone. All were members of the old commission.

At a conference with shippers held at their request at Chicago on June 24, the State Public Utilities Commission of Illinois, refused to take any action with reference to Order No. 28 of the Director-General, advancing freight rates 25 per cent, which went into effect on June 25. Shippers said that the increased rates would work great hardship in connection with contracts made before the freight advance was announced and which include no provision for shipments at advanced rates. The utilities commission advised those who had grievances to get in touch with the Director-General and request him to authorize state commissions to hear such cases and make recommendations to him at Washington.

The Public Service Commission of Maryland has refused to allow, without the usual 30 days' notice, increases of fare proposed by the Washington, Baltimore & Annapolis electric railway, and the Baltimore & Annapolis Short Line. These roads wished to increase their local fares to three cents a mile, with corresponding increases in season tickets, and their application is understood to have been approved by the United States Railroad Administration, operating competing steam railroads. The Public Service Commission found, however, that for the first four months of this year, the first-named road had gross revenues of $744,074 as against $314,988 in the same period of 1917; while the Short Line had gross revenues of $142,060, almost double the receipts for the first four months of 1917. The carriers will probably now renew their applications, with the thirty-day proviso, and the commission is expected to make a further study of the tariffs.

Court News

Intervening Cause of Injury

The South Carolina Supreme Court holds that, in an action for personal injuries under the federal act by a station master who was assaulted by a robber at night while engaged in interstate commerce, the proximate cause of the injury was the act of the robber, and not the defendant railroad company's failure to maintain sufficient lights about the station. When the negligence alleged appears merely to have brought about a condition or situation under which another and entirely independent and efficient agency intervenes to cause the injury, the latter is the proximate cause and the former the remote cause.—Carter v. Atlantic Coast Line (S. Car.), 95 S. E., 357. Decided February 19, 1918.

Injuries to Passenger Stepping Off Car

A passenger stepping off a car upon a stepping box placed by trainmen on the platform was injured by the box slipping from under his feet. In an action against the railroad it was not claimed that the stepping box was defective, that the passenger was not given ample time to alight, that the place or the manner in which the box was placed was careless, improper, or negligent, and all the testimony confirmed the railroads' claim that the box was level and firm and did not move prior to the passenger's stepping upon it. The New York Court of Appeals holds that the rule of res ipsa loquitur did not apply against the railroad, and that the evidence was insufficient to show any negligence on its part. Beltz v. B., R. & P. (N. Y.), 119 N. E., 81. Decided February 12, 1918.

Equipment and Supplies

Car and Locomotive Specialties

The Central Advisory Purchasing Committee of the Railroad Administration has practically completed the ordering of the specialties for the government's order for cars and locomotives. The following additional orders have been placed for the 100,000 freight cars:

Brakebeams:
- 14,250 American Steel Foundries.
- 14,250 Chicago Railway Equipment Company.
- 14,000 Joliet Railway Supply Company.
- 14,000 Davis Brakebeam Company.
- 14,000 Damascus Brake Beam Company.
- 14,000 Buffalo Brake Beam Company.
- 8,000 Haskell & Barker Car Company.
- 7,500 Pressed Steel Car Company.

Journal Boxes:
- 32,500 Union Spring & Manufacturing Company.
- 38,875 National Malleable Castings Company.
- 28,500 T. H. Symington Company.
- 16,125 Gould Coupler Company.
- 4,000 American Malleable Company.
- 8,000 Haskell & Barker Car Company.
- 2,000 Pacific Car & Foundry Company will secure on Pacific coast.

Steel ends for composite gondolas:
- 12,000 Standard Railway Equipment Company.
- 8,000 Chicago-Cleveland Car Roofing Company.

Side bearings:
- 40,000 A. Stucki Company.
- 30,000 E. S. Woods & Co.
- 30,000 Wine Railway Appliance Company.

The following additional specialties have been ordered for the locomotives:

Side bearings for tenders:
- All—A. Stucki Company.

Brake beams for tenders:
- All—Chicago Railway Equipment Company, except 170 to be furnished by the Baldwin Locomotive Works.

Freight Cars

The Lehigh & New England is inquiring for one snow-plow.

The Wisconsin Steel Company is inquiring for one flat car.

The Terminal Railroad Association of St. Louis is inquiring for one dump car.

Balfour, Williams & Co., New York, are inquiring for a number of 8,000-gal. tank cars.

The General Chemical Company, New York, is inquiring for one 40-ton steel, drop bottom, gondola car.

Machinery and Tools

The New York Central Lines is inquiring through its purchasing department in Cleveland, Ohio, for the following list of machines for its various shops in the Central West: One combination grinder; one 42-in. heavy-duty planer; one 36 x 36-in., 12-ft. bed planer; five 24-in. high-duty shapers; one 1¼-in. drill press; two 104-in. boring and turning mills; one 42-in. boring mill; one punching machine with 12-in. throat, with capacity to drill 1-in. hole through 1-in. steel; one 30-in. power cold saw; one No. 3 rotary bevel shear; one 96-in. 500-ton hydraulic wheel press; one 24-in. slotter; two universal tool grinders; one 3½-ft. radial drill; one 24-in. x 12-ft. engine lathe; one 4-in. turret lathe; one 18-in. x 14-ft. engine lathe; one 30-in., 6-ft. 6-in. centers, engine lathe; one 26-in. x 10-ft. back geared engine lathe; one 18-in. x 8-ft. engine lathe; one 24-in. x 8-ft. engine lathe; one 3-in. x 36-in. turret lathe; one 18-in. x 8-ft. lathe; one 6,000-lb. steam hammer.

Supply Trade News

With a view to obtaining a closer co-ordination of its commercial and railroad services and sales, the **Air Reduction Sales Company,** after July 1, will handle its railroad sales through its own railroad department, instead of through the Franklin Railway Supply Company. **Ellsworth L. Mills** has been appointed sales manager of the railroad department and apparatus department, with headquarters at 120 Broadway, New York.

M. B. McBride has resigned as auditor of the Seattle, Port Angeles & Western and the Puget Sound & Willapa Harbor, subsidiaries of the Chicago, Milwaukee & St. Paul, to accept the position of general auditor of the Pacific Car & Foundry Company in Seattle. This company is enlarging its plants at Portland and Renton (Seattle) and has recently taken a contract to build 2,000 box cars for the United States Government. The works are now turning out, among other business, 15 new box cars a day for the Union Pacific.

Clarence R. Neher, consulting engineer, Buffalo, N. Y., died recently in that city. Mr. Neher had been engaged in engineering work since 1880, and at various times since was employed in an engineering capacity by a number of railroads, principally the Ohio & Western and the Richmond & Danville. In 1889, Mr. Neher was appointed division engineer on the Rochester division of the Western New York & Pennsylvania. Recently he was identified with the construction of a new trolley line of the International Railway between Buffalo and Niagara Falls, which has recently been put into operation.

W. S. Murrian, superintendent of motive power and equipment of the Southern Railway, resigned, effective May 1, to become president and general manager of the Southern Locomotive Valve Gear Company, Knoxville, Tenn. Mr. Murrian learned the trade of machinist and worked in that capacity for several years. He came from the Union Pacific 15 years ago to the position of master mechanic of the Southern Railway at Alexandria, and was later transferred to Spencer, N. C., in the same capacity. At that time the Southern Railway was building the largest locomotive shops on the system at Spencer. After about two years service at that point, Mr. Murrian was promoted, in 1906, to superintendent of motive power, with headquarters at Knoxville, Tenn. Mr. Murrian is personally interested in the specialties now being manufactured by the Southern Locomotive Valve Gear Company, and he is also thoroughly familiar with the efficiency of the commodities, the Southern Railway having adopted the Southern valve gear as its standard several years ago. Mr. Murrian succeeded General L. D. Tyson, now in active service in the United States Army, who had been president since the organization of the company until recently when he resigned.

Trade Publications

INSLEY PRODUCTS.—The Insley Mfg. Company, Indianapolis, Ind., has issued a 100-page catalog descriptive of its concrete handling equipment. This publication opens with a general discussion of the gravity method of handling concrete, including some cost data, followed by illustrations of various installations of this equipment on different classes of concrete construction projects. The back part of the catalog is devoted to descriptions, illustrations and lists of the various types of equipment handled, including buckets, chutes, hopper cars and carts, towers, etc.

WHEN YOU BUY WAR SAVINGS STAMPS you do not give your money, you loan it at 4 per cent compounded quarterly. You help your Government, but you help yourself even more.

THE UNITED STATES EXPORTED STEEL RAILS in the calendar year 1917 valued at $23,950,000 and cars for railways at $11,883,000, according to a bulletin of the National City Bank of New York.

Railway Construction

CHICAGO, MILWAUKEE & ST. PAUL.—This company has commenced the construction of connections with the Chicago & North Western outer belt line in the Chicago switching district, in order to make its Godfrey yard available to its northbound lines. One connection is being built to the belt line from Bensonville, Ill., just west of the Godfrey yard, and the other from Techny, on its main line to Milwaukee, Wis. The contract for the grading on the Bensonville connection has been awarded to John McAndrews, Chicago, and the grading on the Techny connection is being done by John Marsch, Inc., Chicago. Counting some additional tracks in the Godfrey yard, 4.4 miles of double track will be laid at a cost of about $300,000. Track laying will be done by the company's own forces.

The St. Paul has commenced grading on double track construction in Minnesota. Second track will be laid to connect up all the gaps in the present double track from St. Paul, Minn., to Aberdeen, S. D. The contract for the grading has been awarded to Morris & Dougherty, St. Paul, Minn., and track laying will be done by company forces.

The railroad is preparing to rebuild its bridge over the Missouri river at Chamberlain, S. D. A new pontoon, 266 ft. long, and two steel truss spans, each 300 ft. long, will be erected by company forces.

The St. Paul is rebuilding its engine house at Calmar, Iowa, which was recently destroyed by fire.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is preparing to build three short stretches of second track in Missouri between Allerton and Trenton and two in Kansas between Topeka and Herington.

CHOCTAW, NEWCASTLE & WESTERN.—This railway is being built from a connection with the Chicago, Rock Island & Pacific, at Alderson, Okla., to Coal Fields, six and one-half miles. C. M. Conway, of Texarkana, Ark., has the contract for the work, which was begun in March. About 75 per cent of the line has been completed. The principal commodity which will be carried will be coal, the annual tonnage of which is estimated at 500,000.

ELGIN, JOLIET & EASTERN.—This company is asking for bids on a brick building, containing lockers, toilet rooms, dormitories, etc., for enginemen and firemen, at Gary, Ind. It has also asked for bids on water softeners to be located at Frankfort, Ill., and Spaulding, and reinforced concrete coaling stations at South Chicago, Ill., and Gary, Ind.

KANAWHA & MICHIGAN.—This railroad has awarded a contract to the Austin company, Cleveland, Ohio, for the construction of an inbound freight house, 40 ft. by 550 ft., with a canopy platform, 12 ft. by 600 ft.; a two-story office building and basement, 144 ft. by 42 ft.; and an outbound freight house, 32 ft. by 300 ft., at Charleston, W. Va. The structures will replace buildings destroyed by fire on May 17. The inbound freight house is to be completed within 50 days of the time work on the building commenced, namely, May 28.

GREAT NORTHERN.—This company is putting in approximately 60 additional passing tracks at various points on its main line this season.

LEHIGH VALLEY.—Work is now under way, constructing with company forces a new engine terminal at Ashmore, Pa., consisting of a 25-stall concrete engine house, also a small section of what will eventually be a brick erecting shop, ash pits of the submerged type, temporary locomotive coaling station, and the necessary track layout.

SAN DIEGO & ARIZONA.—This company is preparing plans for shops, an enginehouse and a freight depot at San Diego, Cal.

TOLEDO & OHIO CENTRAL.—This company has contracted with the Austin company, Cleveland, Ohio, for a complete roundhouse layout at the West Columbus, Ohio, yards. The main structure is to consist of a 20-stall reinforced concrete roundhouse; the additional structures will include a machine shop, boiler house, and oil house. The total contract approximates $250,000 and must be completed in 90 working days.

ANNUAL REPORT

Seaboard Air Line Railway Company—Report of the Directors

FISCAL YEAR ENDED DECEMBER 31, 1917.

PORTSMOUTH, VA., April 18th, 1918.

To the Stockholders of the Seaboard Air Line Railway Company:

The Board of Directors submits the following report of the operations of your properties for the year ended December 31, 1917:

INCOME ACCOUNT FOR YEAR ENDED DECEMBER 31, 1917, COMPARED WITH YEAR ENDED DECEMBER 31, 1916.

	1917	1916	Increase
Gross Revenue	$30,345,146.01	$26,184,487.25	$4,160,658.76
Operating Expenses and Taxes	23,097,430.89	18,742,598.01	4,354,832.88
Net Operating Revenue (after Taxes)	7,247,715.12	7,441,889.24	194,174.12†
Uncollectible Railway Revenue	9,833.70	12,890.34	3,056.64†
Operating Income	7,237,881.42	7,428,998.90	191,117.48†
Other Income	391,375.25	460,431.79	69,056.54†
Gross Income	7,629,256.67	7,889,430.69	260,174.02†
Rents and Other Charges	261,430.75	210,135.81	51,294.94
Hire of Equipment	405,354.28	143,991.87	261,362.41
Applicable to Interest	6,962,471.64	7,535,303.01	572,831.37†
Fixed Interest Charges	4,858,404.50	4,673,292.39	185,112.11
Balance	2,104,067.14	2,862,010.62	757,943.48†
Full 5% Interest on Adjustment (Income) Bonds	1,250,000.00	1,250,000.00	
Net Income	$854,067.14	$ 1,612,010.62	$757,943.48†

† Decrease.

The Gross Revenue increased 15.89 per cent., Operating Expenses increased 23.87 per cent., Taxes increased 14.01 per cent., Operating Expenses and Taxes increased 23.23 per cent.

The Operating Expenses, exclusive of Taxes, were 71.57 per cent. of the Gross Revenue, as compared with 66.96 per cent. the previous year; and including Taxes, 76.12 per cent. of Gross Revenue as compared with 71.58 per cent. for the preceding year.

In common with all other roads, this Company had to meet increased prices in labor and material, due to war conditions. The increase in the prices of these items added to Operating Expenses as follows:

Labor	$1,349,936
Coal	813,628
Other material	759,935

a total arbitrary increase of $2,923,499.

If this arbitrary amount be deducted from the Operating Expenses, they would have shown an increase of 7.20 per cent., instead of the 23.87 per cent., shown above, and the operating ratio, including Taxes, would have been 66.48 per cent., instead of the 76.12 per cent., as compared with 71.58 per cent., for the preceding year. These increases were anticipated and this Company, in common with other carriers, filed with the Interstate Commerce Commission early in the Spring a request for an increase of 15 per cent., in freight rates. The requested increase was denied by the Interstate Commerce Commission. The anticipations of the Company, however, as to the situation were realized, and only by the strictest economy was the property maintained at its former standard without further materially reducing the operating income.

On account of the conditions confronting the railroads of the country, the President took over this property with others by proclamation of December 28, 1917, and the details of the contract with the stockholders for the use of the property by the government are now being worked out.

FUNDED DEBT.

The $688,000 First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds sold during previous year and mentioned in last annual report were delivered on January 31, 1917.

$364,000 First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds were sold during the year.

An issue of $4,000,000 Two Year Six Per Cent. Secured Gold Notes, dated September 15, 1917, payable September 15, 1919, redeemable in whole or in part at the option of the Company at 100.5 per cent. of the face amount thereof and accrued interest at any time upon thirty days published notice, secured by the pledge of First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds of the Company, were sold during the year for the purpose of providing funds for the acquisition of property, completing, extending or improving its facilities or properties, improving or maintaining its service and for the discharging or lawful refunding of its obligations.

The $55,000 outstanding Roanoke and Tar River Railroad Company First Mortgage Six Per Cent. Bonds maturing April 1, 1917, were refunded at maturity by the issue of First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds, in accordance with the provisions of the First and Consolidated Mortgage. The holders of the Roanoke and Tar River Railroad Company First Mortgage Bonds were paid in cash and the First and Consolidated Mortgage Bonds received in this transaction were placed in the treasury of the Company.

EQUIPMENT.

Equipment shown in last annual report as having been undelivered on December 31, 1916, under Equipment agreement, Series "R," viz:

5 Mountain Type Passenger Locomotives.
2 Gas Electric Motor Cars.
50 Steel Under and Upper Frame Caboose Cars

were received during this fiscal year.

An equipment agreement, Series "S," was entered into on December 1, 1917, for the purchase of:

16 Mallet Type Freight Locomotives.
10 Santa Fe Type Freight Locomotives.

Under said agreement the cash payment of $604,340 was represented by a deferred certificate which was received into the treasury of the Company and will be pledged under its First and Consolidated Mortgage in accordance with the provisions thereof, and the remainder of the purchase price was represented by Equipment Trust obligations aggregating $1,200,000, bearing interest at the rate of 6% per annum, payable in twenty semi-annual installments of $60,000, on the first day of June and the first day of December in each year, commencing June 1, 1918, and ending December 1, 1927. Of this equipment there was received during the year:

5 Mallet Type Freight Locomotives.

In addition to the equipment named above, the following were purchased and placed in service during the year:

1 Business Car.
2 Barges.
1 Steam Ditching Car.

MAINTENANCE OF WAY AND STRUCTURES.

ROADWAY, TRACK AND STRUCTURES.

Roadway, track and structures of the company have been properly maintained at a cost of $3,215,505.46, which represents an expenditure per mile of $928.98.

SIDE TRACKS.

38.45 miles of new sidings and extensions of existing sidings were constructed, and there were deducted by removal and changes of old sidings, 7.53 miles, making a net increase over previous year of 30.92 miles.

There were also constructed 0.39 miles of new sidings on leased lines.

TIE RENEWALS.

Tie renewals were 1,241,697 cross ties and 751 sets of switch ties, and the cost, $380,746.09 was charged to Operating Expenses.

RAIL.

100.10 miles of new 90-lb. steel rail were laid in the main line, releasing therefrom lighter worn rail. There was charged net to Operating Expenses therefor, $147,829.95, and to Capital Account $124,585.64.

In addition 32.08 miles of released 60, 70 and 75-lb. steel rail were laid on branch lines, releasing 68-lb. and lighter rail, and there was charged to Operating Expenses therefor, $24,048.13, and to Capital Account $28,373.87.

BALLAST.

91,765 cubic yards of gravel and slag ballast were put under main line track during the year, and of the total cost thereof, $232,715.65 was charged to Capital Account.

TRESTLES FILLED.

2,722 lineal feet of wooden trestles were filled in during the year and of the total cost thereof, including culverts, $8,038.60, was charged to Operating Expenses.

TRESTLES REBUILT AND BALLAST DECKED.

There were built during the year out of creosoted timber 1,970 lineal feet of ballast decked trestles, replacing old open decked trestles and in addition thereto 1,582 lineal feet of old wooden trestles were driven with creosoted piles and capped for ballast decking this year, and of the total cost thereof $16,997.88 was charged to Operating Expenses and $23,748.68 to Capital Account.

TRESTLES STRENGTHENED.

17 trestles were strengthened for heavy traffic by making them 4-ply chord, at a cost of $6,587.97 charged to Capital Account.

BRIDGES.

Work has been done on seven bridges, replacing with steel, or strengthening them for heavier traffic.

Three of these bridges were authorized during the year and all of them have been completed. Of the bridges completed, the principal ones are the three bridges mentioned in last year's report as having been destroyed by the high water of July, 1916, and are as follows:

Catawba River, near Mount Holly, N. C., three through truss spans, each 165 feet long, and one deck girder span 50 feet long.

Catawba River, near Van Wyck, S. C., four through truss spans, each 147 feet long.

Wateree River, near Camden, S. C., one through truss span 200 feet long.

MAINTENANCE OF EQUIPMENT.

The equipment of the Company was fully maintained during the year at a cost of $5,105,472.29.

Included in the cost of maintenance is $114,901.58, representing value of equipment destroyed or retired from service during the year and credited to Cost of Equipment.

There was also included in the Cost of Maintenance $516,321.10 for depreciation, which was credited to Reserve for Accrued Depreciation.

The cost of maintenance per article owned was as follows:

Average cost per annum per Locomotive owned	$3,626.77
Average cost per annum per Passenger car owned	1,095.31
Average cost per annum per Freight car owned	84.15

GENERAL REMARKS.

The extension from Charleston, S. C., to Savannah, Ga., mentioned in last year's report, has been completed, and will be put into operation January 1st, 1918, thus providing two separate and distinct main lines between Hamlet, N. C., and Savannah, Ga. Also, the grade revision work between Hamlet, N. C., and Charleston, S. C., previously mentioned, has been completed, and together with above extension, a through line has been obtained from Hamlet, N. C., to Jacksonville, Fla., via Charleston, with a maximum five-tenths percent. grade in both directions. The new portion of the line from Charleston to Savannah has a maximum three-tenths percent. grade line in both directions which, with the improvements realized from the grade revision between Hamlet and Charleston, will effect a large saving in the handling of traffic between Hamlet and Savannah, and will greatly increase the tonnage per train compared with the tonnage which can be handled via the present Columbia route.

The grade revision work on certain sections of the line between Sanford, N. C., and Hamlet, N. C., mentioned in report of last year, has been completed, thus eliminating two pusher grades and providing a five-tenths percent. grade against northbound traffic and an eight-tenths percent. grade against southbound traffic on these sections. Train operation has thereby been facilitated, hazard reduced, and a saving effected in operating cost.

During the year, a spur track, used and owned jointly by the Southern, Atlantic Coast Line and Seaboard Air Line, has been built to reach the National Army Cantonment located at Columbia, S. C. This spur, together with necessary connecting track, is about 3.64 miles long, and is reached

by the Atlantic Coast Line and Southern through direct connections, and by the Seaboard Air Line over approximately 4.81 miles of Southern Railway Company's track. It connects with and serves the yards and tracks built by the government within the camp reservation. In addition to the main spur and connecting tracks mentioned above, joint yard tracks with a total capacity of approximately 175 cars, were built by the three railways in order to provide adequate operating track facilities.

Two side tracks, having a total capacity of approximately 80 cars, have been constructed at Montgomery, Ala., to serve the National Guard Cantonment at that point.

Construction is now in progress on several important industrial spurs branching off the main line between Charleston, S. C., and Savannah, Ga. These spurs will reach fertile farm lands especially adapted to early vegetable culture, and will be a big factor in the industrial development along this line. A part of these spurs will be completed and put into operation early in the coming year and others will be completed later in the year. All of this work will readily lend itself to plans for further future extensions and developments.

New shop facilities and additions to the present facilities have been provided during the year at Andrews, S. C. This work includes a cinder pit, engine pits, 200-ton coal elevator, sand house, and an extension to the boiler house. In addition, work is now in progress on an 80-foot turntable, oil house, and water facilities for both fire protection and service purposes, all of which will be completed during the coming year.

A coach shop and an upholstery shop, both equipped with automatic sprinklers, have been built during the year at Portsmouth, Va., to replace old building destroyed by fire. New and modern machinery has also been installed, thus providing facilities for repairing coaches at the north end of the company's line.

In order to accommodate the large locomotives recently purchased, it was necessary to lengthen the roundhouses and provide engine pits of greater length at Hermitage, Va., Raleigh, N. C., and Hamlet, N. C. This work is now in progress and will be completed during the early part of the coming year. Also, three additional engine pits of sufficient length have been provided at Monroe, N. C., to accommodate these engines.

A new cinder pit has been built at Raleigh, N. C., during the year. Also, there is now under construction a coal elevator of 200 tons capacity and a sand house. This work will replace structures destroyed by fire and, when completed, will greatly facilitate the handling of locomotives at this terminal.

New turntables, 100 feet long and of sufficient capacity to turn the largest locomotives in the service of the company, have been provided at Hermitage, Va., Raleigh, N. C., Hamlet, N. C., and Monroe, N. C. A released turntable, 65 feet long, has been installed at Georgetown, S. C.; 85 foot turntables, released from service elsewhere, are now being installed at Abbeville, S. C., Howells, Ga., and Birmingham, Ala., and one 80 feet long, previously referred to, is being installed at Andrews, S. C.

The work of the Valuation Committee created as a result of the passage of Section 19-A of the Federal Act to Regulate Commerce was continued during the year at a cost of $84,761.42, which was charged to operating expenses.

The Development Department of the road, which is maintained to attract settlers and industries to the territory served by the Seaboard, was successfully carried on with gratifying results during the year.

CHANGES IN ORGANIZATION.

Effective September 1, 1917, Judge Legh R. Watts, at his request, was relieved from the office of General Counsel and appointed Consulting Counsel. Mr. E. Marvin Underwood was appointed General Counsel.

Effective June 15, 1917, Mr. L. C. Fritch was appointed General Manager.

The Board records its thanks and appreciation to the officers and employees for the faithful discharge of their duties during the year.

By order of the Board.

W. J. HARAHAN,
President.

[ADV.]

Railway Financial News

BALTIMORE & OHIO.—The Ohio Public Utilities Commission has authorized this company to issue $20,000,000 5 per cent bonds, which are to be sold at not less than 80. Of these, $3,000,000 are to pay for improvements made in the past and the balance to pay for improvements approved by the Director General.

BROOKLYN RAPID TRANSIT.—To provide for the extension of $57,735,000 6 per cent notes due July 1, the War Finance Corporation is to loan the Brooklyn Rapid Transit Company $17,320,000 or such less sum as is necessary to carry out the following plan: Note holders are asked to deposit their notes with the Central Trust Company, New York, and the holder of each $1,000 note has the option of taking either $300 in cash and $700 face amount of new three-year 7 per cent Brooklyn Rapid Transit notes, or of taking $1,000 of new three-year 7 per cent notes. In other words, he can take 30 per cent in cash and renew the remaining 70 per cent, or renew the entire amount of his notes. The new notes will be secured by the collateral now deposited as security for the old notes, and, in addition, buy $39,000,000 Brooklyn Rapid Transit consolidated and refunding mortgage bonds. The New York Times says that while these notes are outstanding, the Brooklyn Rapid Transit will pay no dividends in stock and none in script unless the script shall be made to rank junior to the equities of the note holders in the assets of the company.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has declared the regular semi-annual dividends of 3½ per cent and 3 per cent on the 7 per cent and 6 per cent preferred stocks, respectively, payable July 20 to stock of record July 5.

ERIE.—This company gave notice on Tuesday of offers to extend until July 1, 1928, three issues of underlying bonds maturing on July 1 this year. They are the $1,500,000 first mortgage 5 per cent bonds of the Buffalo & Southwestern Railroad, $1,000,000 Buffalo & Southwestern division 5 per cent bonds of the Erie Railroad and $300,000 terminal 5 per cent bonds of the Chicago & Atlantic Railway. It is intended to extend the first and last named issues subject to prior redemption at 105 and interest. Holders of all three issues are asked to deposit their securities with the July 1 coupon attached at the offices of J. P. Morgan & Co. In the case of the Buffalo & Southwestern division issue temporary receipts will be issued exchangeable for bonds of an equal amount, and there will also be paid in cash $110 on each $1,000 bond. The investment yield will be approximately 6½ per cent. Similar conditions will apply in the case of the Chicago & Atlantic terminal bonds, except that the cash payment will be $75 and the yield on the extended bonds about 6 per cent.

PENNSYLVANIA.—The dividend declaration has been deferred until the meeting of the board of directors to be held in July.

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—The directors have deferred action on the dividend, an official statement being made as follows: "The consolidated Pittsburgh, Cincinnati, Chicago & St. Louis (Panhandle), having commenced business on February 1, 1917, has no dividend record during the three years' test period. The board therefore deferred action until such approval has been secured and the money therefor obtained from the government on account of compensation for the use of the property."

SAN DIEGO & ARIZONA.—This company is asking the California Railroad Commission to extend to December 31 the time within which it may issue $1,500,000 bonds which the commission has authorized.

SEABOARD AIR LINE.—See editorial comments elsewhere in this issue.

UNION PACIFIC.—Kuhn, Loeb & Co., New York, have purchased from the Union Pacific a new issue of $20,000,000 10-year 6 per cent bonds to be secured by a deposit of railroad bonds owned by the company. The sale of this issue has been approved by Director General McAdoo. It is understood that the bonds will be offered for public subscription in the near future at 98 per cent and accrued interest.

VIRGINIAN.—See item in General News Department of this issue.

PETROLEUM PROSPECTING IN NEW SOUTH WALES.—A company has been organized for the purpose of determining whether petroleum can be found in New South Wales, Australia. A modern derrick has been erected and machinery installed near Penrith, about 40 miles from Sydney, where surface oil has been found in numerous places in the vicinity of this test well. This will be the first test made in New South Wales for petroleum. The driller who is in charge of operations is a practical oil man from the United States.—*Commerce Reports.*

PROPOSED ENGINEERING CONGRESS IN JAVA.—The preliminaries in connection with the engineering congress that is to be held, in the interests of the Netherlands East Indies, at Batavia in 1919 are already in progress. The congress will probably be divided into six different sections: (1) Harbors and means of communication (railways, tramways, telegraphy, and telephony); (2) irrigation, drainage, water works, etc.; (3) roads and bridges, town planning, architecture, etc.; (4) production of energy, electricity and industries; (5) mining and geology; (6) miscellaneous. The participants in the congress will comprise the experts from the surrounding colonies and also from the neighboring countries, such as western America, Japan, Australia and South Africa.—*Indian Engineering.*

Railway Officers

Executive, Financial, Legal and Accounting

Thomas Hall Gatlin, whose appointment as assistant to president of the Southern Railway, with headquarters at Washington, D. C., has already been announced in these columns, was born on November 8, 1876, at Tarboro, N. C., and was educated at Trinity College, Durham, N. C. He began railway work in May, 1892, in the engineering department of the Atlantic Coast Line. From 1899 to 1901 he served as chief engineer of the East Carolina Railway, and from March, 1905, to July, 1906, was assistant chief engineer in maintenance of way office, in charge of track work drafting and later was engineer maintenance of way, on the Middle district of the Southern Railway at Knoxville, Tenn. On August 1, 1911, he was appointed assistant chief engineer maintenance of way and structures on the Southern Railway at Washington, D. C., and from January, 1917, to June, 1918, served as assistant to vice-president in charge of operation, which position he held until his recent appointment as assistant to president of the same road, as noted above.

T. H. Gatlin

Frederick P. Small, first vice-president and secretary of the American Express Company, has been appointed secretary of the American Railway Express Company, with headquarters at New York. He was born at Augusta, Me., and in 1895 entered the services of the Merchants' Despatch Transportation Company. The following year he went to the American Express Company as a stenographer, and subsequently served consecutively as cashier of the eastern financial department, chief clerk and assistant manager. In 1907 he was appointed line auditor, and later served as second assistant to the first vice-president, until 1914, when he was promoted to first assistant, and was also made assistant secretary of the company. In February, 1915, he was appointed assistant to president, and two months later he was appointed also secretary of the company. Since March, 1918, he served as first vice-president and a member of the executive committee, retaining his duties as secretary of the same company, and now becomes secretary of the American Railway Express Company as above noted.

F. P. Small

Edwin G. Buckland, vice-president and general counsel, of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., has been elected president to succeed Edward J. Pearson.

R. H. Swartwout, vice-president of the Norfolk Southern, with headquarters at New York, has been elected president, to succeed J. H. Young.

John W. Platten, chairman of the board, of the Gulf, Mobile & Northern, with headquarters at New York, has been elected president, succeeding **W. F. Owne,** who becomes assistant to federal manager.

Harry Bronner, chairman of the finance committee of the Missouri Pacific, has been elected president, succeeding **B. F. Bush,** resigned to become regional director of southwestern railroads. Mr. Bronner has been connected with banking and industrial corporations for many years. In 1887 he entered the banking business of Hallgarten & Co., New York, and became a member of the firm in 1904. In October, 1917, he retired from the active banking business, after having become senior partner of that concern. Mr. Bronner has also taken an active part in many railroad reorganizations, notably the Baltimore & Ohio, the Colorado & Southern, and the St. Louis-San Francisco. He has also assisted in the reorganization of a number of industrial companies, and has been actively connected with many corporations, but more particularly with the Missouri Pacific, the Denver & Rio Grande, the American Locomotive Company, the Bethlehem Steel Corporation, the Sloss-Sheffield Steel & Iron Company and the J. G. White Engineering Corporation.

Caleb S. Spencer, vice-president and treasurer of the Adams Express Company, with headquarters at New York, has been appointed vice-president and treasurer of the new American Railway Express Company, with the same headquarters. Mr. Spencer was born at Catskill, N. Y., and entered the service of the American Express Company in 1872, as office boy at Catskill. Two years later he was transferred to Rondout, and later served as general clerk at Westfield, Mass. In 1874 he went to the Adams Express Company as a messenger and in 1876 became waybill and money clerk at New Haven. He subsequently served consecutively as agent at South Norwalk, agent at Fall River, route agent, assistant superintendent at Boston, Mass., and in 1882 became superintendent at Boston. He later served in the same capacity at Bridgeport, and in 1894 was made manager of the New England department. From 1908 to 1913, he retired for rest and travel, and then returned to the service of the Adams Express Company as treasurer and trustee. In 1916 he was appointed vice-president and treasurer of the same company, and now becomes vice-president and treasurer of the American Railway Express Company.

C. S. Spencer

M. B. McBride, auditor of the Seattle, Port Angeles & Western and the Puget Sound & Willapa Harbor, with office at Chicago, has resigned to become general auditor of the Pacific Car & Foundry Company, Seattle, Wash.

Operating

W. L. Park, vice-president of the Chicago Great Western, has been appointed general manager, with headquarters at Chicago.

W. H. Bremner, president of the Minneapolis & St. Louis, has been appointed general manager, with office at Minneapolis, Minn.

John B. Warrington, division superintendent of the Philadelphia & Reading, has been appointed terminal manager at Washington, D. C., with jurisdiction over the Washington Terminal Company, the terminals of the several railroads

and Potomac Yard, reporting to Regional Director Markham of the Allegheny Region.

F. E. House, president and general manager of the Duluth & Iron Range, has been appointed general manager, with office at Duluth, Minn.

A. J. Davidson, general superintendent of the Spokane, Portland & Seattle, has been appointed general manager, with office at Portland, Ore.

Otis Bass has been promoted to chief despatcher on the second district of the Nebraska division of the Union Pacific, at Grand Island, Neb.

LeRoy Kramer, vice-president of the Pullman Company, has resigned, effective June 30, to become federal manager of the St. Louis-San Francisco.

M. P. Blauvelt, vice-president of the Lehigh Valley, has been appointed assistant regional director of the Allegheny region, with office at Philadelphia, Pa.

William A. McGonagle, president and general manager of the Duluth, Missabe & Northern, has been appointed general manager, with office at Duluth, Minn.

B. B. Greer, vice-president and general manager of the Colorado & Southern, has been appointed assistant regional director of central western railroads.

J. P. O'Brien, vice-president and general manager of the Oregon-Washington Railroad & Navigation Company, has been appointed general manager, with office at Portland, Ore.

G. L. Benson has been appointed division superintendent of the Erie, with headquarters at Kent, Ohio, succeeding **J. C. Pierson,** who has been granted leave of absence.

O. Hodges has been appointed superintendent of the Anthony & Northern, with headquarters at Pratt, Kan., succeeding **J. D. Feeney,** who had previously been acting superintendent.

W. J. Jenks, general manager of the Norfolk & Western, continues under the United States Railroad Administration as general manager of that road, with headquarters at Roanoke, Va.

H. L. Crandall has been appointed superintendent of the Minnesota, Dakota & Western, with office at International Falls, Minn., vice **C. H. Woodford,** who has been assigned to other service.

S. A. Eddy has been appointed assistant trainmaster on the Superior division of the Chicago, Milwaukee & St. Paul, with headquarters at Green Bay, Wis., succeeding **D. W. Kelly,** promoted.

C. G. Burnham, executive vice-president of the Chicago, Burlington & Quincy, has been appointed federal manager of that road and of the Quincy, Omaha & Kansas City, with office at Chicago.

A. M. Schoyer, resident vice-president of the Pennsylvania Lines at Chicago, has been appointed assistant to the federal manager of the Pennsylvania Western Lines, with headquarters at Pittsburgh, Pa.

W. B. Wood, general manager of the Grand Rapids & Indiana, continues under the United States Railroad Administration as general manager of that road, with headquarters at Grand Rapids, Mich.

B. C. Byers, assistant general superintendent of the Clevelard, Cincinnati, Chicago & St. Louis, has been promoted to general superintendent at Indianapolis, Ind., succeeding **E. M. Costin,** promoted to federal manager. **C. S. Millard,** division superintendent at Mattoon, Ill., succeeds Mr. Byers, with office at Indianapolis. **P. T. White,** superintendent of the Peoria & Eastern at Indianapolis, succeeds Mr. Millard at Mattoon, and **Robert Alison,** trainmaster at Galion, O., has been appointed superintendent, succeeding Mr. White.

Charles H. Reynolds, whose appointment as assistant general superintendent of the Chicago & North Western, with headquarters at Norfolk, Neb., was announced in the *Railway Age* on June 14, was born at Springfield, Ill., on July 13, 1859. He entered railroad service with the Chicago & North Western in June, 1879, as a clerk at Winona, Minn. Subsequently, he was chief clerk in the safety office and division superintendent on the Fremont, Elkhorn & Missouri Valley, now a part of the North Western. From March, 1903, to the date of his recent promotion, noted above, he was division superintendent of the North Western at Norfolk, Neb.

Traffic

L. M. White, general agent of the Missouri Pacific at Detroit, Mich., has left the service of that company to go with the Judson Freight Forwarding Company at Detroit as export agent.

Engineering and Rolling Stock

Leigh Goodrich Curtis, whose appointment as assistant chief engineer of the Baltimore & Ohio, with headquarters at Baltimore, Md., was announced in the *Railway Age* on May 31, was born at Hamilton, Ohio, on November 28, 1874. After completing his education in the Ohio State university in 1899, he entered railway service as a civil engineer in the office of the superintendent maintenance of way of the Baltimore & Ohio, at Zanesville, Ohio. In December, 1900, he was promoted to assistant engineer in the same office. Two years later he became assistant division engineer at Chicago, and in June, 1903, he was promoted to division engineer at the same point. From April, 1910, to 1914, he was engineer maintenance of way of the northwest district, following which he became district engineer of the Chicago division, at Chicago, which position he held until his appointment as assistant chief engineer, as mentioned above.

L. J. Putnam, whose appointment as chief engineer of the Chicago & North Western, with headquarters at Chicago, has already been announced in these columns was born at Manchester, Iowa, on February 17, 1878, and was educated at Cornell College, Mount Vernon, Iowa, where he studied civil engineering. He began railway work in June, 1898, with the Illinois Central, and in June of the following year went with the Chicago & North Western as an instrument man. From February, 1901, to March, 1906, he was assistant engineer on construction, location and maintenance on that line, following which he was acting division engineer of the Ashland division, at Kaukauna, Wis. Beginning with March, 1907, he was consecutively assistant engineer in charge of second track and terminal improvements at Janesville, Wis.; assistant engineer in charge of the construction of a bascule bridge over the north branch of the Chicago river, and the Wells street yard at Chicago; resident engineer on the Milwaukee track elevation, and resident engineer on the Escanaba ore dock construction. From July, 1910, to April 1, 1912, he was with the Milwaukee, Sparta & North Western, a subsidiary of the Chicago & North Western, first as resident engineer on construction and then as acting resident engineer. On April 1, 1912, he was promoted to division engineer at Boone, Ia., and in May, 1913, he was again promoted to principal assistant engineer, with headquarters at Chicago, which position he held until his promotion as noted above.

L. J. Putnam

W. C. Kegler, engineer maintenance of way of the Cleveland-Indianapolis division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Galion, Ohio, has been appointed district engineer in charge of construction, with the same headquarters. **W. S. Burnett,** engineer maintenance of way of the Cincinnati-Sandusky division, with headquarters at Springfield, Ohio, has been appointed district

engineer in charge of construction, with the same headquarters. **J. E. Kissell,** engineer maintenance of way of the Cairo division, with headquarters at Mt. Carmel, Ill., has been appointed acting engineer maintenance of way at Galion, Ohio., in place of Mr. Kegler. **E. J. Byer,** assistant engineer maintenance of way at Galion, Ohio, has been appointed acting engineer maintenance of way at Mt. Marmel, Ill., succeeding Mr. Kissel, transferred. **R. B. Stokley,** assistant division engineer maintenance of way at Springfield, Ohio, has been appointed acting engineer maintenance of way at Springfield, Ohio, in place of Mr. Burnett. The above changes were effective June 24.

Robert J. Middleton, whose appointment as assistant chief engineer of the Puget Sound Lines of the Chicago, Milwaukee & St. Paul, with headquarters at Seattle, Wash., succeeding E. O. Reeder, retired, was announced in the *Railway Age* of June 24, was born at Greenwood, Ark., in 1881, and graduated from the civil engineering department of the University of Arkansas in 1903. On February 2, 1906, Mr. Middleton entered the service of the Chicago, Milwaukee & St. Paul as a draftsman in the bridge and building department at Chicago. In the fall of that year he was promoted to assistant engineer on the Kansas City division at Ottumwa Junction, Ia., where he remained until October, 1908, at which time he became assistant engineer on the Evanston track elevation, at Evanston, Ill. Three years later he was appointed assistant engineer in charge of the construction of the Savanna, Ill., and Godfrey yards. In January, 1913, he was promoted to engineer of track elevation at Chicago, and in April, 1915, he became valuation engineer, which position he held until his present promotion as noted above.

R. J. Middleton

Thomas H. Strate, whose promotion to valuation engineer of the Chicago, Milwaukee & St. Paul, succeeding R. J. Middleton, was announced in these columns on June 21, was born at Moorhead, Minn., on April 9, 1880, and received his education at the University of Minnesota, graduating from the civil engineering department in 1901. On June 3 of that year, Mr. Strate entered the service of the Chicago, Milwaukee & St. Paul as a rodman and chainman on the Preston branch in Iowa. Later he became instrument man. From 1902 to 1903 he was resident engineer on construction and grade reduction at Faribault, Minn., and during the following three years he was assistant engineer in charge of maintenance and construction in the district office at Minneapolis, Minn. Subsequently, he was consecutively locating engineer, assistant division engineer and division engineer of construction on the line between Glenham, S. D., and Marmarth, N. D., and on the James river branch between Aberdeen, S. D., and Mobridge. From 1912 to 1915 he was construction engineer on double track work between Minneapolis, Minn., and Aberdeen, S. D., following which he became valuation field engineer, which position he held until his recent promotion ,as noted above.

T. H. Strate

C. M. Rogers, inspector of tonnage rating of the Chicago, Rock Island & Pacific, has been appointed supervisor of stationary plants, with headquarters at Chicago, effective June 15, succeeding **J. H. Edwards,** resigned.

E. O. Reeder, assistant chief engineer of the Puget Sound Line of the Chicago, Milwaukee & St. Paul, with headquarters at Seattle, Wash., whose resignation from that position on account of ill health was announced in the *Railway Age* on June 21, has been connected with the Chicago, Milwaukee & St. Paul for many years. His first connection with that company was in the purchasing department previous to 1875, where he was connected with the purchases of ties, timber, etc. His first work in the engineering department was in connection with the construction of a tunnel at Tunnel City, Wis. In 1879, he became resident engineer at Melvina, Wis., and had charge of the engineering work between Melvina, Wis., and Westby. Later he was transferred to Fayette, Iowa, following which he assisted in the survey and location of the bridge over the Mississippi river at Sabula, Iowa. Subsequently, he was engaged in a number of surveys, including the line from Monroe, Wis., to Dubuque, Iowa, and the Ottumwa line from Cedar Rapids, Iowa, to Sigourney. Later, Mr. Reeder took charge of the chief engineers' office, where he had much to do with the location of the Puget Sound line. He then became principal assistant engineer. He was appointed chief engineer of the Puget Sound lines with headquarters at Seattle, Wash., in June, 1911, and was made assistant chief engineer when this line was consolidated with the St. Paul. He remained in that position until his resignation as noted above.

Railway Officers in Government Service

Fred Pettijohn has been appointed chief accountant of the Railroad Administration, reporting to the auditor, J. W. Roberts.

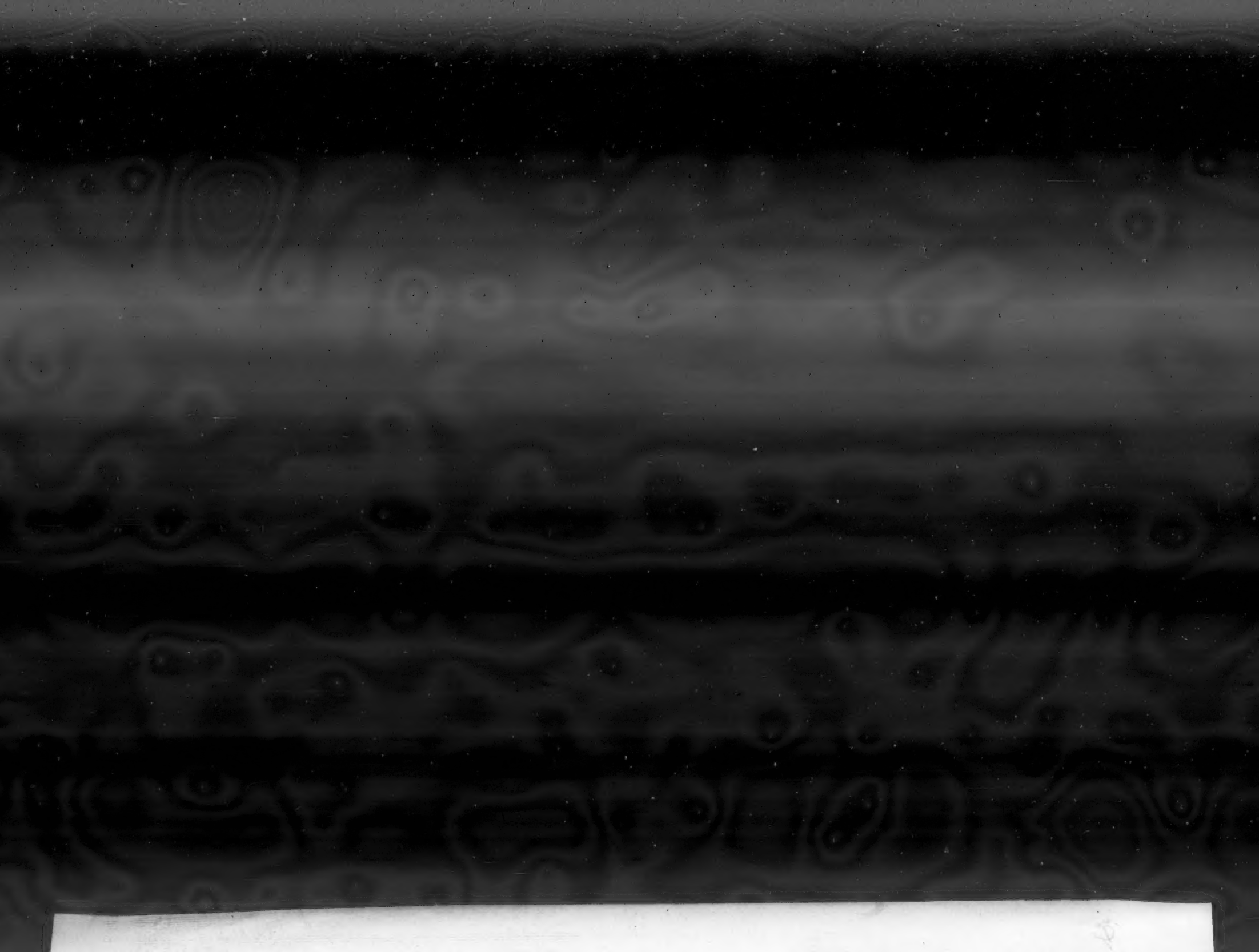
C. S. Lake, formerly general manager of the Seaboard Air Line, has been appointed assistant to **C. R. Gray,** director of the Division of Operation.

B. J. Feeney, traveling engineer of the Yazoo & Mississippi Valley, with office at Memphis, Tenn., has been appointed supervisor of the Fuel Conservation section, Southern Regional district, United States Railroad Administration, with office at Atlanta, Ga.

C. B. Dailey, assistant to the director of purchases of the Southern Pacific, has been appointed assistant manager, and **L. G. Plant** has been appointed progress engineer of the Procurement Section of the Central Advisory Purchasing Committee of the Railroad Administration.

Railway Officers in Military Service

J. J. Duggan, chief despatcher of the Southern Pacific at Bakersfield, Cal., has received a lieutenant's commission in the United States Army, and is now en route to France to serve in an overseas contingent.

C. H. Nichols, formerly chief despatcher of the Southern Pacific at Bakersfield, Cal., has received a commission as first lieutenant, and has been assigned to Company C, 31st Railway Engineers, stationed at Ft. Leavenworth, Kan.

TEUTONS BUILDING TWO RAILWAY IN FINLAND.—According to Associated Press despatches the Germans are building two temporary railways in Northern Finland. One line runs eastward toward Kem on Mourmansk railway in Russia and the other northeastward from a rail-end in Finland toward Petoenga Bay, which is included in the strip of the Mourmansk region which Russia is preparing to cede to Finland. Construction work is easy as there are many small lakes which can be utilized.